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U.S. ARMY CORPS
OF ENGINEERS
OMAHA DISTRICT

March 1996

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200159

**FINAL
PRE-DESIGN TECHNICAL MEMORANDUM
HIMCO DUMP SUPERFUND SITE
ELKHART, INDIANA**

Prepared For:

United States
Environmental Protection Agency
Region 5
Chicago, Illinois



Prepared By:

Department of the Army
Corps of Engineers
Omaha District
Omaha, Nebraska

TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	EX-1
1.0 INTRODUCTION	1-1
1.1 General	1-1
1.2 Project Objective	1-1
1.3 Investigation Tasks	1-1
1.4 Report Organization	1-3
2.0 SITE BACKGROUND AND HISTORY	2-1
3.0 PREVIOUS INVESTIGATIONS	3-1
4.0 SITE INVESTIGATION TASKS	4-1
4.1 Sampling Objectives	4-1
4.2 Sampling Program	4-2
4.2.1 Monitoring and Residential Well Survey	4-2
4.2.2 Soil Borings/Sampling for Monitoring Wells	4-4
4.2.3 Monitoring Well Installation	4-10
4.2.4 Monitoring Well Development	4-12
4.2.5 Ground Water Elevation Survey	4-13
4.2.6 Ground Water Sampling	4-13
4.2.7 Monitoring Well Abandonment	4-14
4.2.8 Surveying	4-15
5.0 SITE CHARACTERIZATION	5-1
5.1 Geotechnical Testing of Site Soils	5-1
5.2 Ground Water Flow	5-1
5.3 Contaminant Characterization	5-7
5.3.1 Analytical Results - 1995 Ground Water Sampling Round	5-10
5.3.2 Comparative Analysis of Ground Water Analytical Results	5-18
6.0 QUALITY CONTROL SUMMARY	6-1
6.1 Sampling Procedures	6-1
6.2 Summary of Daily Quality Control Reports and Field Log Books	6-1
6.2.1 Work Performed	6-1

TABLE OF CONTENTS (CONT.)

6.3	Analytical Procedures	6-1
6.4	Quality Control Activities	6-1
6.4.1	Trip Blanks	6-1
6.4.2	Field Duplicates	6-1
6.4.3	Surrogate Spikes	6-2
6.4.4	Matrix Spikes	6-2
6.4.5	Matrix Spike Duplicates	6-2
6.4.6	Laboratory Blanks	6-2
6.4.7	Laboratory Control Samples	6-2
6.4.8	Rinsate Blanks	6-2
6.5	Data Presentation	6-2
6.5.1	Volatile Organic Compounds	6-2
6.5.1.1	Holding Times	6-2
6.5.1.2	Method Blanks	6-3
6.5.1.3	Surrogate Spikes	6-3
6.5.1.4	Matrix Spike/Matrix Spike Duplicates	6-3
6.5.1.5	Internal Standards	6-3
6.5.1.6	Field Duplicates	6-3
6.5.1.7	Trip Blanks	6-3
6.5.1.8	Rinsate Blanks	6-3
6.5.1.9	Overall Assessment	6-6
6.5.2	Semi-Volatile Organic Compounds	6-6
6.5.2.1	Holding Times	6-6
6.5.2.2	Method Blanks	6-6
6.5.2.3	Surrogate Spikes	6-7
6.5.2.4	Matrix Spike/Matrix Spike Duplicates	6-7
6.5.2.5	Laboratory Duplicate Samples	6-7
6.5.2.6	Field Duplicates	6-7
6.5.2.7	Rinsate Blanks	6-7
6.5.2.8	Overall Assessment	6-7
6.5.3	Pesticides/PCBs	6-7
6.5.3.1	Holding Times	6-7
6.5.3.2	Method Blanks	6-8
6.5.3.3	Surrogate Spikes	6-8
6.5.3.4	Matrix Spike/Matrix Spike Duplicates	6-8
6.5.3.5	Laboratory Duplicate Samples	6-8
6.5.3.6	Field Duplicates	6-8
6.5.3.7	Rinsate Blanks	6-8
6.5.3.8	Overall Assessment	6-8
6.5.4	Metals and Cyanide Sample Data Group MEAFG1	6-8
6.5.4.1	Holding Times	6-8

TABLE OF CONTENTS (CONT.)

6.5.4.2	Preparation Blank and Continuing Calibration Blank	6-9
6.5.4.3	Matrix Spike and Matrix Spike Duplicate Samples	6-10
6.5.4.4	Rinsate Blanks	6-10
6.5.4.5	Overall Assessment	6-10
6.5.5	Metals and Cyanide Sample Data Group MEAFH6	6-10
6.5.5.1	Holding Times	6-10
6.5.5.2	Preparation Blank and Continuing Calibration Blank	6-10
6.5.5.3	Matrix Spike and Matrix Spike Duplicate Samples	6-12
6.5.5.4	Overall Assessment	6-12
6.6	Overall Project Data Assessment	6-12
7.0	CONCLUSIONS	7-1
8.0	REFERENCES	8-1

APPENDICES

Appendix A: Photographs

Appendix B: Monitoring Well Boring Logs

Appendix C: Geotechnical Test Results

Appendix D: Monitoring Well Construction Diagrams

Appendix E: Monitoring Well Development Records

Appendix F: Monitoring Well Gauging Forms

Appendix G: Monitoring Well Sampling Records

Appendix H: Laboratory Data

LIST OF TABLES

<u>Number</u>	<u>Title</u>
4-1	Summary of Monitoring and Residential Well Survey
4-2	Surveying Data
5-1	Results from Site-Wide Water Level Survey
5-2	Analytical Methods
5-3	USEPA Sample Number to Monitoring Well Correlation Table
5-4	1995 Analytical Data Summary for Ground Water Samples
5-5	Analyte Levels as a Function of Time
6-1	Summary of Rinsate and Trip-Blank Contamination
6-2	Method Blank Contamination
6-3	Preparation and CCB Contamination for SDG MEAFG1
6-4	Rinsate Blank Results
6-5	Preparation and CCB Contamination for SDG MEAFH6

LIST OF PHOTOGRAPHS

<u>Number</u>	<u>Title</u>
1	View to the southwest of the WT101 monitoring well cluster.
2	Closeup of monitoring well WT101A.
3	Closeup of monitoring well WT101B.
4	Closeup of monitoring well WT101C.
5	View to the southeast of the WT102 monitoring well cluster.
6	Closeup of monitoring well WT102A.
7	Closeup of monitoring well WT102B.
8	Closeup of monitoring well WT102C.
9	Closeup of monitoring well WT103A.
10	Closeup of monitoring well WT104A.
11	Closeup of monitoring well WT105A.
12	Closeup of monitoring well WT106A.
13	Closeup of monitoring well WT111A.
14	View to the west of the WTB monitoring well cluster.
15	Closeup of monitoring well WTB1.
16	Closeup of monitoring well WTB2.
17	Closeup of monitoring well WTB3.
18	Closeup of monitoring well WTB4.
19	Closeup of monitoring well WTCP1.
20	Closeup of monitoring well WTE1.

LIST OF PHOTOGRAPHS (CONT.)

<u>Number</u>	<u>Title</u>
21	Closeup of monitoring well WTE2.
22	Closeup of monitoring well WTE3.
23	Closeup of monitoring well WTM1.
24	Closeup of monitoring well WTM2.
25	Closeup of monitoring well WTO1.
26	Closeup of monitoring well WTP1.
27	Closeup of piping in the basement of the Geesaman Residence which is connected to residential well RW-06.
28	Closeup of pump and piping which is connected to residential well RW-07 (Klein Property).
29	Closeup of residential well RW-08 (Bowers Property).
30	Closeup of residential well RW-09 (Culry Property, formerly owned by Jerry and Kim Watson).
31	Closeup of residential well RW-10 (Burke Property).
32	Monitoring well WTE1 final redevelopment water sample.
33	Monitoring well WTO1 final redevelopment water sample.
34	Monitoring well WT101A final redevelopment water sample.
35	Monitoring well WT101B final redevelopment water sample.
36	Monitoring well WT102A final redevelopment water sample.
37	Monitoring well WT102B final redevelopment water sample.
38	Monitoring well WT111A (mislabelled WT118A) final redevelopment water sample.

LIST OF PHOTOGRAPHS (CONT.)

<u>Number</u>	<u>Title</u>
39	Monitoring well WT112A final development water sample.
40	Monitoring well WT112B final development water sample.
41	Monitoring well WT113A final development water sample.
42	Monitoring well WT113B final development water sample.
43	Monitoring well WT114A final development water sample.
44	Monitoring well WT114B final development water sample.
45	Monitoring well WT115A final development water sample.
46	Monitoring well WT116A final development water sample.
47	Monitoring well WT116B final development water sample.
48	Monitoring well WT117A final development water sample.
49	Monitoring well WT117B final development water sample.
50	Monitoring well WT118B final development water sample.

LIST OF ACRONYMS AND ABBREVIATIONS

Al	Aluminum
BGS	Below Ground Surface
BOD	Biological Oxygen Demand
Ca	Calcium
CCB	Continuing Calibration Blank
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limits
DQCR	Daily Quality Control Reports
Fe	Iron
FS	Feasibility Study
FSP	Field Sampling Plan
FTLC	Full Target List Compound
gpm	Gallons per Minute
I.D.	Inside Diameter
K	Potassium
LCS	Laboratory Control Sample
MCL	Maximum Contaminant Level
Mg	Magnesium
MRO	Omaha District
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSL	Mean Sea Level
Na	Sodium
NCP	National Contingency Plan
Ni	Nickel
NTU	Nephelometric Turbidity Unit
PCB	Polychlorinated Biphenyl
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RI	Remedial Investigation
ROD	Record of Decision
RPD	Relative Percent Difference
SARA	Superfund Amendment and Reauthorization Act
SOW	Scope of Work
SSHP	Site Safety and Health Plan
SVOC	Semi-volatile Organic Compound

LIST OF ACRONYMS AND ABBREVIATIONS (CONT.)

TIC	Tentatively Identified Compound
TM	Technical Memorandum
TOC	Top of Casing
TSS	Total Suspended Solids
ug/L	Micrograms per Liter
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
Zn	Zinc

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (USACE) Omaha District was requested by the U.S. Environmental Protection Agency (USEPA) to develop a detailed design for the selected remedial action at the Himco Dump Superfund Site as set forth in the Record of Decision (ROD). As part of the design effort, the USEPA requested that additional sampling studies be conducted to supplement the available technical data and to provide the necessary information to more fully characterize the site conditions.

Field work was conducted from July 31 through October 21, 1995. Field work performed included a soil gas survey, a monitoring and residential well survey, the completion of 12 soil borings and the installation of monitoring wells in all of these borings, geotechnical sampling of soils, and analytical testing of ground water from all of the newly installed monitoring wells and 7 of the existing monitoring wells.

Ground water was encountered from approximately 3 to 16 feet below ground surface at elevations ranging from 751 to 757 feet Mean Sea Level (MSL). Ground water elevations showed a relatively flat horizontal hydraulic gradient (average of 0.001 feet/feet) trending south to southeast in the shallow and intermediate portions of the water table aquifer.

In general, the analytical results from the Pre-Design investigation confirmed and extended the analytical findings of the Remedial Investigation (RI) in that contaminants in the ground water attributable to the Himco Site continue to migrate off-site. Ground water quality both up and down gradient of the Himco Site does not appear to have changed significantly since the RI sampling event with regards to Metals, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), and Pesticides/Polychlorinated Biphenyls (PCBs).

During the field investigation, construction debris was encountered in borings for monitoring wells WT116A and WT116B. Ground water samples from monitoring well WT116A yielded detects of Benzene at 15 ug/L, which is above the current MCL of 5 ug/L, and numerous previously unreported SVOCs. This data suggests that portions or all of the construction debris area may contain higher levels of contamination than previously recognized and/or a release is occurring from the landfill and is travelling in the ground water beneath the construction debris area.

1.0 INTRODUCTION

1.1 General

This document is prepared as the Pre-Design Technical Memorandum (TM) of findings for studies conducted at the Himco Dump Superfund Site (Himco), located in Elkhart County, Elkhart, Indiana (Figure 1-1). The purpose of this TM is to present a summary of the sampling and analytical activities conducted by the U.S. Army Corps of Engineers (USACE) Omaha District from July 31 through October 21, 1995, along with the findings.

1.2 Project Objective

The major objective of this Pre-Design study (referred to as Remedial Design/Remedial Action Field Activities in the Final Field Sampling Plan) was to gather additional chemical data in order to determine whether ground water quality at the Himco Site has deteriorated since the last sampling round was conducted. The last sampling round occurred during Phase II of the Remedial Investigation (RI) in September of 1991. Site specific sampling objectives are presented in Section 4.0, Site Investigation Tasks. All activities for this project were conducted in accordance with provisions of the Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act of 1986 (CERCLA/SARA), and in accordance with appropriate requirements of the National Contingency Plan (NCP).

1.3 Investigation Tasks

To fulfill the project objective outlined above, the following tasks were completed:

- Review and evaluation of the Remedial Investigation/Feasibility Study (RI/FS) Report (Donohue, 1992) and the Record of Decision (ROD)(EPA, 1993).
- Visual site inspection.
- Preparation of a Field Sampling Plan (FSP) Addendum by USACE personnel, and Quality Assurance Project Plan (QAPP) and Site Safety and Health Plan (SSHP) Addendums by RUST personnel. RUST was contracted by the USACE Omaha District to complete the QAPP and SSHP Addendums due to a shortage of personnel to perform the work in-house.
- Examination and documentation of the condition of 23 existing monitoring wells and 5 residential wells.
- Drilling and sampling of twelve soil borings, and the installation of ground water monitoring wells in each of these borings.



Source: USGS 7.5 Minute Quadrangle
Osceola, Indiana (1980)
Elkhart, Indiana (1981)

Scale: 1 inch equals 2000 feet

Figure 1-1 Site Location Map

- Measuring the depth to ground water and obtaining ground water elevation data from 18 existing monitoring wells and 12 newly installed wells.
- Ground water sampling of 19 new and existing monitoring wells.
- Evaluation of physical and chemical data.

These completed tasks resulted from an Interagency Agreement between the USACE Omaha District and the U.S. Environmental Protection Agency (USEPA) Region 5.

1.4 Report Organization

This TM presents all aspects of work conducted by the USACE Omaha District to date at the Himco Site. This includes planning and implementation of the field investigations program, laboratory analyses, data reduction, and qualitative data evaluation. The remainder of this TM is organized into seven sections. Those sections of this TM which reference back to the RI Report for a full discussion of the subject matter include Section 2.0 (Site Background and History), and Section 3.0 (Previous Investigations). Section 4.0 of this TM describes those field activities conducted in the course of the USACE Omaha District's field investigations. Section 5.0 presents site specific data and observations on the hydrogeology, along with summaries of the analytical program and physical tests. Section 6.0 describes the Quality Control (QC) activities and procedures in the field and laboratory, and the usability of the resulting data set. Section 7.0 presents the USACE Omaha District's conclusions. The references cited in the text are listed in Section 8.0.

2.0 SITE BACKGROUND AND HISTORY

A full discussion on the background and history of the Himco Site, including physical characteristics of the site area, is provided in the Final Remedial Investigation Report, Volume 1 (Donohue, 1992).

3.0 PREVIOUS INVESTIGATIONS

A full discussion on the nature and extent of contamination as defined from previous investigations is provided in the Final Remedial Investigation Report, Volume 1 (Donohue, 1992).

4.0 SITE INVESTIGATION TASKS

This section presents an overview of the sampling activities conducted by USACE Omaha District personnel from July 31 through October 21, 1995 for the Pre-Design field investigation. Sampling and analysis activities were performed in accordance with procedures contained in the approved FSP (USACE, 1995) and QAPP (RUST, 1995) Addendums. Deviations from the FSP/QAPP Addendums and/or the original documents they amend, and problems encountered in the field are discussed below. All soil samples collected for geotechnical analyses, along with water samples from a 4,000-gallon poly tank used during this field investigation, were submitted to the USACE Omaha District (MRO) Laboratory for analyses. All ground water samples collected for organic analyses were sent to Ross Analytical Services, Inc., Strongsville, Ohio. All ground water samples collected for inorganic analyses were sent to American Analytical and Technical Services, Baton Rouge, Louisiana.

4.1 Sampling Objectives

The major objective of this Pre-Design study at the Himco Site was to collect additional chemical data in order to determine whether ground water quality has deteriorated since the last sampling round was conducted. The last sampling round occurred during Phase II of the RI in September of 1991. A secondary objective of this field study was to obtain the necessary information for design of a landfill gas collection system. Matrix and site specific sampling objectives included collecting additional data to:

Subsurface Soil

- Further characterize the stratigraphy and physical properties of the soils.
- Assess the occurrence and levels of methane gas generation.

Ground Water

- Characterize concentrations of organic and inorganic contaminants within the shallow and intermediate portions of the water table aquifer south and east (downgradient) of the landfill boundary.
- Evaluate whether levels of inorganic contamination existing in ground water within the shallow and intermediate portions of the water table aquifer are a result of site activities at the Himco Site or if they are representative of natural background levels.
- Further assess the occurrence of ground water in the shallow and intermediate portions of the water table aquifer underneath and immediately adjacent to the Himco Site.

4.2 Sampling Program

The following field activities were intended to meet the sampling objectives listed above. The location of all monitoring and residential wells sampled/surveyed during this field investigation are shown in Figure 4-1. A final copy of the report documenting field activities and results for the soil gas sampling was submitted to USEPA Region 5 in the 30% Design Analysis package (dated September 1995), and is not included in this memorandum.

4.2.1 Monitoring and Residential Well Survey

Prior to the installation of any new monitoring wells, a survey of all existing monitoring wells within and immediately adjacent to the Himco Site, along with certain residential wells to the south of the Himco Site along County Road 10, was performed. This included the following: WTB1, WTB2, WTB3, WTB4, WTCP1, WTE1, WTE2, WTE3, WTM1, WTM2, WT01, WTP1, WT101A, WT101B, WT101C, WT102A, WT102B, WT102C, WT103A, WT104A, WT105A, WT106A, WT111A, RW-06, RW-07, RW-08, RW-09, and RW-10. Monitoring wells C1, C3, and C4 were found to have been abandoned between November 12, 1985 and April 17, 1986 (Duwelius and Silcox, 1991). Monitoring wells WTD1, WTD2, WTD3, and WTN1 were also not included in the survey as they could not be located in the field. It is believed that these wells have been abandoned although no record or visual evidence of abandonment exists. Access to residential wells RW-01 and RW-02 was denied by the landowner. Residential wells RW-04 and RW-05 could not be located. According to the property owner, these wells may exist underneath a portion of their residential structure. The approved FSP Addendum indicated the possible existence of a shallow residential well on the Klein property in addition to the deep well. No evidence of this additional well was found.

The monitoring well survey consisted of visually inspecting the protective casing, riser, and bollards. Locks that were present on the protective casings were cut and replaced so that all locks were keyed alike. A water level measurement was taken with an electronic water level indicator, and the depth to the bottom of the well was measured using a weighted tape. A 5-foot long by 1.25-inch nominal diameter polyvinyl chloride (PVC) pipe filled with clean filter pack sand and capped at both ends was then lowered down the riser of all monitoring wells except WT106A in order to ensure that each well was plumb, aligned, and that a ground water sampling pump could be lowered down the well to the screened interval. A 3-foot long by 1.5-inch nominal diameter disposable bailer was used to check the alignment of monitoring well WT106A. The survey of this monitoring well was performed near the end of all field activities associated with the Himco Site due to problems in obtaining the access agreement in a timely fashion.

The residential well survey consisted of visually inspecting the well head and interior of the casing if it could be opened; however, no measuring equipment was introduced into any of the wells. Photographs of all monitoring and residential wells or their associated pump/piping may be found in Appendix A of this document.

Symbol	Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by:
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Drawn by:
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Checked by:
R.J.G.

Reviewed by:
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Submitted by:

Chief: GEOLOGY A Section

ELKHART, INDIANA
REMEDIAL ACTION
HIMCO DUMP SUPERFUND SITE
MONITORING AND RESIDENTIAL WELL
LOCATION MAP

Plot Scale Ratio: 200:1

Design File: EH01200PG3.dgn

Spec. No.:
DACA 45

Contract No.:
DACA 45

Date:
X

Drawing Code:

X

Sheet
reference
number:

GX.XX

200 FEET
200'

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DESIGN &
DRAFTING

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A summary of the monitoring and residential well survey is located in Table 4-1. In general, all the existing monitoring wells installed during the RI were found to be in good condition; however, suitable concrete well pads were not noted at any of these wells. A protective bollard was replaced at WT101B, and one was added at WT105A. All existing USGS wells with above-ground completions were also found to be in good condition, although these wells did not have outer protective casings, bollards, or a concrete well pad. None of the USGS wells with flush-mount completions appeared to have manholes which were properly grouted in. In addition, all of these flush-mount wells had a considerable amount of soil inside the manhole. Protective casings and bollards were installed at the following USGS wells which were recommended for future ground water monitoring: WTB1 through WTB4, WTE1, and WTE3. USACE had recommended that the manhole be replaced at WTO1; however, this was inadvertently overlooked. Should this well be used for future ground water monitoring as recommended by the USACE, then the manhole should be replaced and a locking well cap installed. A total of five wells were abandoned during this Pre-Design field effort. USGS monitoring wells WTE2 and WTP1 were abandoned due to obstructions located approximately 8.4 and 6.2 feet, respectively, below the top of the well riser. USGS wells WTCP1, WTM1, and WTM2 were abandoned as they were located within or immediately adjacent to the landfill. In addition, accumulated sediment in the screened interval of monitoring wells WTB2, WTB3, WTE3, and WT102C was removed.

Residential wells RW-06 and RW-07 have apparently been capped and no further action is required. Wells RW-08 and RW-09 are no longer in use, and it is recommended that these wells be abandoned. Well RW-10 is currently used by the landowner for watering their lawn and garden, and no further action is recommended as this well appears to be in good condition and constructed properly.

4.2.2 Soil Borings/Sampling for Monitoring Wells

A total of twelve soil borings were drilled and sampled at various locations around the Himco Site for the installation of monitoring wells. Originally, eleven soil borings/monitoring wells were proposed. Boring/well WT113B was added as a replacement for WTD3, which had been determined during the well survey to have been abandoned in the past. Borings for monitoring wells WT114A and WT114B were relocated approximately 140 feet from their original proposed location to the east side of John Weaver Parkway (Nappanee Street Extension) after encountering the calcium sulfate layer and landfill refuse while drilling at the original staked location. The original boring for monitoring well WT117B was abandoned due to difficulties in setting the subsurface casing. A new boring for the monitoring well was completed approximately 10 feet south of the first location.

All borings were completed with a Gus Pech 1100C truck-mounted drilling rig. Shallow monitoring well borings were drilled using 4 1/4-inch inside diameter (I.D.) hollow-stem augers, and intermediate monitoring well borings were drilled using 6 1/4-inch I.D. hollow-stem augers. The approved FSP Addendum called for the use of a CME continuous sample tube to obtain soil samples. This sampler was used for a portion of the first boring drilled (WT113B), then was

TABLE 4-1
SUMMARY OF MONITORING AND RESIDENTIAL WELL SURVEY
PRE-DESIGN TECHNICAL MEMORANDUM
HIMCO DUMP SUPERFUND SITE
ELKHART, INDIANA

WELL NO.	CONDITION OF WELL	WATER LEVEL INFORMATION			TOTAL DEPTH (FT)	ALIGNMENT TEST	RECOMMENDED ACTION
		DATE	ELEVATION (FT)	(1) DEPTH (FT)			
WT101A (NORTHERN WELL IN CLUSTER)	GOOD CONDITION; LACKS SUITABLE CONCRETE WELL PAD.	8/5/95	752.19	9.81	16.22	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER SAMPLES AND ELEVATIONS.
WT101B (MIDDLE WELL IN CLUSTER)	GOOD CONDITION; ONE PROTECTIVE POST DISTURBED (45° SLANT); LACKS SUITABLE CONCRETE WELL PAD.	8/5/95	752.14	9.76	98.47	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	REPLACE PROTECTIVE POST; CONTINUE USING FOR GROUND WATER SAMPLES AND ELEVATIONS.
WT101C (SOUTHERN WELL IN CLUSTER)	GOOD CONDITION; LACKS SUITABLE CONCRETE WELL PAD.	8/5/95	751.97	9.43	164.58	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER ELEVATIONS.
WT102A (SOUTHERN WELL IN CLUSTER)	GOOD CONDITION; LACKS SUITABLE CONCRETE WELL PAD.	8/4/95	757.22	9.48	15.62	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER SAMPLES AND ELEVATIONS.
WT102B (NORTHERN WELL IN CLUSTER)	GOOD CONDITION; LACKS SUITABLE CONCRETE WELL PAD.	8/4/95	757.24	9.16	64.7	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER SAMPLES AND ELEVATIONS.
WT102C (MIDDLE WELL IN CLUSTER)	GOOD CONDITION; LACKS SUITABLE CONCRETE WELL PAD.	8/4/95	757.94	8.36	157.52	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER ELEVATIONS.
WT103A	GOOD CONDITION; LACKS SUITABLE CONCRETE WELL PAD.	8/8/95	754.21	3.94	15.92	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER ELEVATIONS.
WT104A	GOOD CONDITION; LACKS SUITABLE CONCRETE WELL PAD.	9/23/95	751.77	11.22	16.22	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER ELEVATIONS.
WT105A	ONLY 2 PROTECTIVE POSTS; LACKS SUITABLE CONCRETE WELL PAD.	8/8/95	751.99	8.31	16.04	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	PUT IN THIRD PROTECTIVE POST; CONTINUE USING FOR GROUND WATER ELEVATIONS.
WT106A	ONE PROTECTIVE POST LOOSE; LACKS SUITABLE CONCRETE WELL PAD.	8/8/95	751.77	7.43	15.98	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER ELEVATIONS.
NOTES: 1. DEPTH IS REFERENCED TO THE GROUND SURFACE. 2. N/A-DATA NOT AVAILABLE OR NOT APPLICABLE. SEE COMMENT UNDER HEADING "CONDITION OF WELL" FOR EXPLANATION.							

TABLE 4-1 (CONTINUED)
SUMMARY OF MONITORING AND RESIDENTIAL WELL SURVEY
PRE-DESIGN TECHNICAL MEMORANDUM
HIMCO DUMP SUPERFUND SITE
ELKHART, INDIANA

WELL NO.	CONDITION OF WELL	WATER LEVEL INFORMATION			⁽¹⁾ TOTAL DEPTH (FT)	ALIGNMENT TEST	RECOMMENDED ACTION
		DATE	ELEVATION (FT)	⁽¹⁾ DEPTH (FT)			
WT111A	GOOD CONDITION; LACKS SUITABLE CONCRETE WELL PAD.	8/7/95	753.02	11.38	19.76	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	CONTINUE USING FOR GROUND WATER SAMPLES AND ELEVATIONS.
WTB1 (WESTERN WELL IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PADS.	8/7/95	755.67	6.13	200. (INSUFFICIENT TAPE LENGTH TO MEASURE BOTTOM OF HOLE)	BOTTOM OF SLUG PASSED THRU 325' OF WELL (INSUFFICIENT AMOUNT OF LINE TO REACH BOTTOM).	INSTALL PROTECTIVE CASING AND POSTS; CONTINUE TO USE FOR GROUND WATER ELEVATIONS.
WTB2 (3RD WELL FROM THE EAST IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD.	8/7/95	755.09	6.11	7.64	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	INSTALL PROTECTIVE CASING AND POSTS; CONTINUE TO USE FOR GROUND WATER ELEVATIONS.
WTB3 (2ND WELL FROM THE EAST IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD.	8/7/95	755.38	5.72	116.75	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	INSTALL PROTECTIVE CASING AND POSTS; CONTINUE TO USE FOR GROUND WATER ELEVATIONS.
WTB4 (EASTERN WELL IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD.	8/7/95	755.18	5.92	172.77	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	INSTALL PROTECTIVE CASING AND POSTS; CONTINUE TO USE FOR GROUND WATER ELEVATIONS.
C1	ABANDONED.	² N/A	N/A	N/A	N/A	N/A	N/A
C3	ABANDONED.	N/A	N/A	N/A	N/A	N/A	N/A
C4	ABANDONED	N/A	N/A	N/A	N/A	N/A	N/A
WTCP1	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD. WELL WAS ABANDONED PRIOR TO OBTAINING WELL RISER ELEVATION AND STICKUP.	8/10/95	N/A	N/A	N/A	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	ABANDON-TOO CLOSE TO LANDFILL BOUNDARY.
WTD1	ABANDONED.	N/A	N/A	N/A	N/A	N/A	N/A
NOTES: 1. DEPTH IS REFERENCED TO THE GROUND SURFACE. 2. N/A-DATA NOT AVAILABLE OR NOT APPLICABLE. SEE COMMENT UNDER HEADING 'CONDITION OF WELL' FOR EXPLANATION.							

TABLE 4-1 (CONTINUED)
SUMMARY OF MONITORING AND RESIDENTIAL WELL SURVEY
PRE-DESIGN TECHNICAL MEMORANDUM
HIMCO DUMP SUPERFUND SITE
ELKHART, INDIANA

WELL NO.	CONDITION OF WELL	WATER LEVEL INFORMATION			TOTAL DEPTH (FT)	ALIGNMENT TEST	RECOMMENDED ACTION
		DATE	ELEVATION (FT)	(1) DEPTH (FT)			
WTD2	ABANDONED.	N/A	N/A	N/A	N/A	N/A	N/A
WTD3	ABANDONED.	N/A	N/A	N/A	N/A	N/A	N/A
WTE1 (NORTHERN WELL IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD.	8/5/95	752.32	10.58	68.57	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	INSTALL PROTECTIVE CASING AND POSTS; CONTINUE TO USE FOR GROUND WATER SAMPLES AND ELEVATIONS.
WTE2 (MIDDLE WELL IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD.	8/5/95	N/A	10.80	12.52	BOTTOM OF SLUG DID NOT PASS BEYOND 8.44' BELOW TOP OF RISER.	ABANDON.
WTE3 (SOUTHERN WELL IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD.	8/5/95	752.19	10.41	172.84	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	INSTALL PROTECTIVE CASING AND POSTS; CONTINUE TO USE FOR GROUND WATER SAMPLES AND ELEVATIONS.
WTM1 (NORTHERN WELL IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD.	8/8/95	N/A	16.54	98.42	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	ABANDON-ON LANDFILL.
WTM2 (SOUTHERN WELL IN CLUSTER)	NO OUTER PROTECTIVE CASING, POSTS, OR CONCRETE WELL PAD.	8/8/95	N/A	14.93	22.90	BOTTOM OF SLUG PASSED TO 17.9' BELOW THE TOP OF THE RISER.	ABANDON-ON LANDFILL.
WTN1	ABANDONED.	N/A	N/A	N/A	N/A	N/A	N/A
WTO1	MANHOLE DOES NOT APPEAR TO BE PROPERLY GROUTED; SOIL INSIDE MANHOLE TO WITHIN 1' OF TOP OF RISER; THREADED PROTECTIVE CAP.	8/5/95	751.71	11.12	29.78	SLUG PASSED THROUGH ENTIRE LENGTH OF WELL.	REPLACE MANHOLE AND INSTALL A LOCKING CAP; CONTINUE USING FOR GROUND WATER SAMPLES AND ELEVATIONS.
WTP1	MANHOLE DOES NOT APPEAR TO BE PROPERLY GROUTED; SOIL INSIDE MANHOLE TO WITHIN 1' OF TOP OF RISER; WELL RISER IS NOT VERTICAL AT THE TOP; THREADED PROTECTIVE CAP.	8/5/95	N/A	9.62	20.71	BOTTOM OF SLUG DID NOT PASS BEYOND 6.25' BELOW TOP OF RISER.	ABANDON.
NOTES: 1. DEPTH IS REFERENCED TO THE GROUND SURFACE. 2. N/A-DATA NOT AVAILABLE OR NOT APPLICABLE. SEE COMMENT UNDER HEADING 'CONDITION OF WELL' FOR EXPLANATION.							

TABLE 4-1 (CONTINUED)
SUMMARY OF MONITORING AND RESIDENTIAL WELL SURVEY
PRE-DESIGN TECHNICAL MEMORANDUM
HIMCO DUMP SUPERFUND SITE
ELKHART, INDIANA

WELL NO.	CONDITION OF WELL	WATER LEVEL INFORMATION			TOTAL DEPTH (FT)	ALIGNMENT TEST	RECOMMENDED ACTION
		DATE	ELEVATION (FT)	DEPTH (FT)			
RW-01	ACCESS TO WELL DENIED BY LANDOWNER.	N/A	N/A	N/A	N/A	N/A	N/A
RW-02	ACCESS TO WELL DENIED BY LANDOWNER.	N/A	N/A	N/A	N/A	N/A	N/A
RW-04	UNABLE TO LOCATE WELL HEAD. LANDOWNER UNSURE OF LOCATION.	N/A	N/A	N/A	N/A	N/A	N/A
RW-05	UNABLE TO LOCATE WELL HEAD. LANDOWNER UNSURE OF LOCATION.	N/A	N/A	N/A	N/A	N/A	N/A
RW-06	WELL LOCATED INSIDE GARAGE; OWNER INDICATED WELL WAS NO LONGER IN USE AND HAD BEEN CAPPED.	N/A	N/A	N/A	N/A	N/A	NO FURTHER ACTION.
RW-07	WELL LOCATED IN BASEMENT; OWNER INDICATED WELL WAS NO LONGER IN USE AND HAD BEEN CAPPED.	N/A	N/A	N/A	N/A	N/A	NO FURTHER ACTION.
RW-08	WELL INTACT; PUMP IS IN WELL AND ELECTRIC SERVICE IS IN PLACE; WELL APPEARS TO BE IN GOOD CONDITION.	N/A	N/A	N/A	N/A	N/A	WELL IS NO LONGER IN USE AND SHOULD BE PROPERLY ABANDONED.
RW-09	WELL INTACT AND WITHIN A 6' SQUARE BY 3' HIGH CONCRETE BLOCK STRUCTURE WITH REMOVABLE WOOD ROOF; NO ELECTRIC SERVICE; OLDER WELL. PRESUMABLY SHALLOW.	N/A	N/A	N/A	N/A	N/A	WELL IS NO LONGER IN USE AND SHOULD BE PROPERLY ABANDONED.
RW-10	WELL INTACT; COULD NOT REMOVE WELL CAP; FROM OUTWARD APPEARANCE, WELL WAS PROPERLY CONSTRUCTED TO CURRENT STANDARDS.	N/A	N/A	N/A	N/A	N/A	WELL IS CURRENTLY USED BY LANDOWNER FOR WATERING LAWN. NO FURTHER ACTION.
NOTES: 1. DEPTH IS REFERENCED TO THE GROUND SURFACE. 2. N/A-DATA NOT AVAILABLE OR NOT APPLICABLE. SEE COMMENT UNDER HEADING 'CONDITION OF WELL' FOR EXPLANATION.							

replaced with a 2-inch diameter carbon steel split-spoon for the remainder of the drilling due to heaving sands and bad sample recovery with the CME sampler. The split-spoons were driven by a 140-pound automatic trip hammer.

The drilling equipment was decontaminated between each borehole while the drill rig was decontaminated between sites (each nested well location is considered a site). A decontamination (decon) area was set up on the southeastern portion of the site. This decon area did not impact drilling or sampling operations and was located close to County Road 10 off of the landfill. Decon fluids were collected in a bermed, sloping decon pad and pumped into 450-gallon poly tanks that were later emptied into a 4,000-gallon trailer mounted poly tank. Clean drilling equipment was kept off of the ground by sawhorses or racks that were located on the rig. Steam cleaning was performed using a high temperature steam cleaner. The water source for all decon and drilling activities was a fire hydrant located at the intersection of County Road 10 and John Weaver Parkway. Sediment from the decon pad was dewatered, containerized in a 55-gallon drum, and disposed of by the USACE. Drill cuttings from the first five feet for borings WT115A, WT116A, WT116B, WT117A, WT117B and WT118B were containerized in 55-gallon drums and spread out on the landfill. Drill cuttings and excess samples generated for wells WT112A, WT112B, WT113A, WT113B, WT114A, and WT114B were spread out evenly on the ground around their respective borings.

Sampling for lithologic logging was performed along the entire length of the deeper borings (B designations) at well sites 113, 116, and 117. The shallow borings (A designations) at these sites were augered down to the screened interval of the monitoring well to be installed, and a sample was then obtained for logging purposes. Sampling for lithologic logging was performed in both the shallow and deep borings at well sites 112 and 114. The shallow boring at each of these sites were sampled to the bottom of the hole. The deeper borings at these sites were augered down to approximately the bottom of the adjacent shallow boring, then sampling occurred to the bottom of the deeper boring. Borings WT115A and WT118B did not have an associated nested well, and were sampled for lithologic logging along their entire lengths. Boring WT113B was continuously sampled down to 25 feet below ground surface using the CME continuous sample tube, then every 5 feet thereafter to the bottom of the hole using split-spoons. The remaining borings that were sampled were done so with split-spoons on 5-foot centers. All soil samples were inspected and classified by a geologist using the Unified Soil Classification System (USCS). Logs for all the soil borings are presented in Appendix B.

Eleven representative disturbed soil samples were retained from the borings at the screened interval for geotechnical analyses. A geotechnical sample was inadvertently not retained from shallow boring WT113A. The results of the geotechnical testing may be found in Appendix C. Disturbed samples were visually examined and classified, with similar soils grouped together. A representative soil sample from each group was tested for grain size distribution and Atterberg limits.

4.2.3 Monitoring Well Installation

A total of twelve ground water monitoring wells were installed at various locations and depths around the Himco Site. Six monitoring wells were completed in the shallow portion of the aquifer, and six in the intermediate portion of the aquifer. The shallow aquifer monitoring wells were installed within soil borings previously numbered WT112A, WT113A, WT114A, WT115A, WT116A, and WT117A. The six intermediate wells constructed are WT112B, WT113B, WT114B, WT116B, WT117B, and WT118B. Monitoring wells WT112A, WT112B, WT113A, and WT113B were constructed upgradient of the area impacted by site activities to provide additional background ground water data. Wells WT114A and WT114B were constructed downgradient of the eastern-most landfill boundary along the east side of the John Weaver Parkway. Wells WT115A, WT116A, WT116B, WT117A, and WT117B are located near the downgradient (south) edge of the landfill.

A brief outline of the equipment and methodologies used to complete the borings for well installations may be found in Paragraph 4.2.2, Soil Borings/Sampling for Monitoring Wells. Well installation was performed within 4 1/4-inch I.D. hollow-stem augers for all shallow monitoring wells, and 6 1/4-inch I.D. hollow-stem augers for all intermediate monitoring wells.

Shallow monitoring wells were installed to depths (to the bottom of the screened interval) ranging from 12.6 to 22.0 feet below ground surface (bgs), with the well screens placed across the water table. Intermediate monitoring wells were installed to depths ranging from 58.4 to 67.2 feet bgs, with the well screens placed to monitor the middle portion of the aquifer. Well construction diagrams may be found in Appendix D.

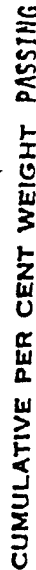
All well casings and screens are constructed of threaded, flush-joint, 2-inch nominal diameter Schedule 40 PVC. A 0.2-foot long cap was placed at the base of the screen. All well screens are a continuous-wrap design with 0.020-inch slot size. Screen lengths range from 5 feet for intermediate wells to 10 feet for shallow wells. No adhesives or solvents were used to join sections of well casing or screen. Prior to installation, all well materials were steam cleaned and protected by plastic sheeting if not immediately installed.

A filter pack consisting of Colorado Silica Sand 16-30 was poured down the annular space between the well screen and augers. Figure 4-2 shows the gradations of this filter pack. The bottom of the well screens were placed above 0.4 to 2.2 feet of filter pack sand, and the filter pack extends from 0.5 to 11.2 feet above the top of the well screen. A 1.0 to 10.5 foot thick seal of bentonite slurry or 3/8-inch diameter bentonite pellets was placed directly above the filter pack. The bentonite seal for intermediate wells WT112B, WT114B, and WT116B consists of Enviroplug High Solids Bentonite Grout manufactured by Wyo-Ben, Inc. The decision to change the type of bentonite seal was made after encountering heaving sands, which had made it difficult for the bentonite pellets to be placed. The bentonite grout was tremied into place while the bentonite pellets were poured down the annular space between the well riser and augers. A cement-bentonite grout mixture was then tremied into the remaining annular space up to the

Form No. 1-1
Please mention above
when ordering

L.B

Date _____



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4-11

Figure 4-2 Filter Pack Gradation Sheet for Colorado Silica 16-30 Production Sand

ground surface. The proportions of this grout mixture were one 94-pound bag of Portland Cement Type I, 6 to 7 gallons of water, and 3 pounds of bentonite powder.

Surface completions for the monitoring wells deviated from the approved FSP Addendum in that the protective posts were initially set inside the concrete pad rather than the outside. After the pads had time to settle, it was noticed that there was no definite slope away from the well. The existing pads were broken up and the posts removed. New concrete pads were constructed measuring 3-foot square by 4-inch thick. Three 2-inch diameter steel posts were equally spaced around the well outside the concrete pads and grouted in. The concrete was spread so that it slopes away from the well. The outside of the casing and protective posts were painted orange and an 1/8-inch diameter drainage hole was drilled into the outer protective casing just above the level of the bentonite-cement grout that occupies the space between the protective casing and the well riser. The well risers were cut off between 2.0 and 2.8 feet above ground surface and water tight expandable caps were installed. Wells WT114A and WT114B were originally scheduled for completion as flush mount wells, but were completed as above ground monitoring wells after they were relocated as they are sufficiently far away from John Weaver Parkway, and are not considered a hazard to vehicles.

4.2.4 Monitoring Well Development

All newly installed wells were developed subsequent to installation, along with seven of the existing wells (WTE1, WTO1, WT101A, WT101B, WT102A, WT102B, and WT111A). The newly installed wells were allowed to sit undisturbed for 1 to 11 days after completion of grouting prior to initiating development. Only monitoring well WT115A was developed one day after the completion of grouting. This unusually short time frame is not believed to have had any adverse impact on the well or the ground water analytical data which was subsequently obtained. Similar values of pH, temperature, and dissolved oxygen were obtained from ground water in WT115A and other shallow monitoring wells in the area (WT101A and WT116A) during the development and/or sampling. All development water was containerized at the individual well sites, and later transferred to the 4,000-gallon poly tank.

Prior to development, the depth to water and total depth of the well were determined with an electronic water level indicator. This data was used to calculate the quantity of water in the casing. All monitoring wells were developed by mechanical surging and pumping. A 4-inch diameter sand pump (a type of bailer) and the drill rig was used to surge monitoring well WTE1, then a 4-inch diameter Grundfos submersible pump was used for continuous pumping. Development was accomplished in the remainder of the wells using a 2-inch nominal diameter QED Well Wizard positive displacement pump. Surge rings were attached to the pump so that surging and pumping were performed concurrently. Surging was accomplished by raising and lowering the bailer or pump intake within the screened interval. Surging continued until the water in the well began to visually clear up. At that time, the well was continuously pumped. Temperature, pH, specific conductivity and turbidity were periodically monitored during the continuous pumping. These readings, along with the amount of water removed from the well, were recorded on well development records. Well development records may be found in Appendix E. The only instrument malfunction to occur involved the turbidity meter while developing monitoring well WT113B.

Well development was considered complete when the temperature, pH, and specific conductivity had stabilized, and the water was relatively clear and free of fines. The specific conductivity and temperature were considered stabilized when there was less than a 10% change between four consecutive readings. The pH was considered stabilized when there was a difference of no more than 0.2 pH units between four consecutive readings. The pH, temperature, and conductivity generally stabilized relatively quickly after the initiation of continuous pumping. Occasionally one of these parameters would not stabilize, especially the specific conductivity. Failure of conductivity levels to stabilize may have been related to higher turbidity levels which were encountered in some wells. Turbidity was the most difficult parameter in terms of reaching the desired goal (5 nephelometric turbidity units (NTUs) or less). Only monitoring wells WT102B and WT117B were under the criteria for turbidity levels. Monitoring wells WTO1, WT115A, WT117A, and WT118B all exhibited relatively higher turbidities (greater than 50 NTUs) upon completion of development. During the purging process for ground water sampling, turbidities were noticeably lower in all the monitoring wells due to the low-flow sampling method employed.

The final water withdrawn from the well during development was collected in a 1 liter clear glass jar, labelled, and immediately photographed with a 35mm color photo. Photographs of the final development waters may be found in Appendix A of this document.

Accumulated sediment was removed from the screened intervals of existing monitoring wells WTB2, WTB3, WTE3, and WT102C. The Well Wizard pump used for development was also used to clean the sediment out of these wells. The pump was lowered to the bottom of these wells and pumped for five to ten minutes. The water and sediment that was removed was containerized in a 425-gallon poly tank, and later transferred to the 4,000-gallon poly tank.

4.2.5 Ground Water Elevation Survey

A complete round of ground water elevation measurements were obtained from the twelve newly installed wells and seventeen existing wells on September 16, 1995. This site-wide ground water elevation survey was conducted prior to ground water sampling activities. Measurements from all wells were completed within an 8-hour period in order to reduce external variables such as weather conditions. Prior to taking water level measurements, the well caps were removed and all monitoring wells were allowed to vent for a minimum of 30 minutes. The depth to water and total depth of the well were then determined with an electronic water level indicator. Water levels were rechecked between 30 minutes to nearly 7 hours later to ensure that water levels had stabilized. Ground water elevation data is summarized in Section 5.0, Site Characterization. Well gauging forms may be found in Appendix F.

4.2.6 Ground Water Sampling

Ground water samples were collected from each of the twelve newly installed wells, and seven of the existing wells (WTE1, WTO1, WT101A, WT101B, WT102A, WT102B, and WT111A) between September 18th and 29th, 1995. The water source for drilling and decon purposes (fire

hydrant) was also sampled, as well as the contents in the 4,000-gallon poly tank for disposal purposes. Wells were allowed to stabilize for 22 to 35 days after development/redevelopment prior to sampling. All ground water samples were analyzed for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Pesticides/Polychlorinated Biphenyls (PCBs), and Metals. The contents of the poly tank were analyzed for VOCs, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), and Total Suspended Solids (TSS). Personnel from EIS Environmental Engineers, Inc. of South Bend, Indiana were on-site to observe all ground water sampling activities. Split-samples were collected for each analyte at each monitoring well by USACE personnel, and handed to the EIS representative. The ground water analytical results are summarized in Section 5.0, Site Characterization. The following procedures were used in the collection of ground water samples.

Prior to purging and sampling a well, the static water level was measured with an electronic water level indicator. This data was used to calculate the quantity of water in the casing. The submersible pump was lowered down the well such that the pump intake was located within the screened interval, and a minimum of five submerged casing volumes of water was then purged from the well. Purge rates and volumes ranged from 0.1 to 2 gallons per minute (gpm) and 5 to 350 gallons, respectively. Water quality parameters (temperature, specific conductivity, pH, dissolved oxygen, and turbidity) were measured with the use of a QED FC2000 flow-through cell at the start of purging, and approximately every well volume or multiple of thereafter. Dissolved oxygen readings were not obtained during the purging of monitoring well WTE1 due to equipment problems. Purging continued beyond the five casing volumes until the parameters had stabilized, then ground water samples were obtained. Monitoring well sampling records containing this information may be found in Appendix G. Purge water from wells was containerized in 425-gallon poly tanks and later transferred to the 4,000-gallon poly tank.

Purging and sampling was done in such a manner as to minimize agitation or aeration of the well water. A Grundfos Redi-Flow II submersible pump with dedicated teflon-lined polyethylene tubing was used for all purging and sampling. Purge rates ranged from approximately 0.1 to 2 gpm, with a sampling rate which approached the lower limit of the pump, ranging from 500 to 1000 ml/min. Low sampling rates were chosen to minimize the suspension of particulate matter which could effect the analytical results, and to more closely approximate ground water conditions. All non-dedicated sampling equipment was thoroughly decontaminated prior to each sampling event to prevent possible cross-contamination.

4.2.7 Monitoring Well Abandonment

Five existing monitoring wells were abandoned during the course of this field effort, including WTCP1, WTP1, WTM1, WTM2, and WTE2. Monitoring well WTP1 had a flush-mount completion, while the remainder of the wells abandoned had above-ground completions. None of the above-ground wells had protective posts or concrete pads that needed to be removed.

The riser for each well was cut off approximately 2 feet below ground surface. The well was plugged using a cement-bentonite grout mixture. The grout mixture used was the same as that

for monitoring well installation (see page 4-12 of Section 4.2.3 for mixture). The grout mixture was tremied down the well. Pumping continued until the grout level reached the ground surface in all the abandoned wells except WTE2. At WTE2, the grout was brought to approximately 2 feet below ground surface, then the remainder of the boring was backfilled with natural soils.

4.2.8 Surveying

A survey of all newly installed and existing monitoring wells used in this Pre-Design investigation was completed in October 1995 by USACE Omaha District. Elevations for the monitoring wells were taken on the top of the riser and on average ground. A listing of this survey data may be found in Table 4-2.

Table 4-2
Surveying Data
Pre-Design Technical Memorandum
Himco Dump Superfund Site
Elkhart, Indiana

Monitoring Well Number	Northing	Easting	Top of Riser Elevation ¹	Ground Elevation ¹
WTB1	1533596.77	405953.28	763.65	761.8
WTB2	1533597.11	405959.05	763.18	761.2
WTB3	1533597.39	405968.13	763.28	761.1
WTB4	1533595.28	405975.91	762.33	761.1
WTE1	1531566.72	407131.36	765.75	762.9
WTE3	1531548.54	407126.66	765.47	762.6
WT01	1532407.14	407876.93	762.83	762.83
WT101A	1531629.81	407616.98	764.34	762.0
WT101B	1531617.03	407621.69	764.23	761.9
WT101C	1531603.13	407627.48	764.11	761.4
WT102A	1534850.57	405943.64	769.09	766.7
WT102B	1534872.79	405939.79	768.82	766.4
WT102C	1534862.86	405941.85	769.20	766.3
WT103A	1532537.59	405538.04	762.61	758.2
WT104A	1531495.73	406017.30	765.29	763.0
WT105A	1531172.44	407102.56	762.58	760.3
WT106A	1530938.53	407760.41	761.50	759.2
WT111A	1531905.43	406358.78	766.45	764.4
WT112A	1533653.49	406824.67	765.90	763.6
WT112B	1533653.01	406834.06	766.09	763.4
WT113A	1533608.69	407789.11	771.85	769.2
WT113B	1533604.43	407779.02	772.06	769.3
WT114A	1531843.97	407997.29	769.19	766.7
WT114B	1531834.38	407995.71	769.37	766.9
WT115A	1531675.84	407261.44	765.87	763.6

Table 4-2 (Continued)
Surveying Data
Pre-Design Technical Memorandum
Himco Dump Superfund Site
Elkhart, Indiana

Monitoring Well Number	Northing	Easting	Top of Riser Elevation¹	Ground Elevation¹
WT116A	1531925.50	406784.96	763.86	761.7
WT116B	1531931.04	406775.79	763.89	761.9
WT117A	1532201.98	405908.93	767.19	764.8
WT117B	1532202.51	405896.41	766.60	764.4
WT118B	1531917.55	406361.16	766.49	764.1

1. Feet Mean Sea Level (MSL)

5.0 SITE CHARACTERIZATION

This section presents the findings of the Pre-Design field investigation at the Himco Site. Included is a discussion on the site-specific hydrogeology, and characterization of the contaminants and their distribution. A complete discussion on the regional and site-specific geology, including stratigraphy, may be found in the Final Remedial Investigation Report (Donohue, 1992). Logs of borings completed for the Pre-Design investigation (see Appendix B) support the lithologic/stratigraphic findings of previous investigations, and additional characterization of the site soils was not deemed necessary in this document. Results of testing the contents of the 4,000-gallon poly tank may be found in Appendix H.

5.1 Geotechnical Testing of Site Soils

The goal of the geotechnical soil sampling and testing was to support the field classifications made by the USACE geologist and to confirm that the filter pack was properly sized to the formation material.

Results of the laboratory classification are summarized in Appendix C. Laboratory testing shows that materials in the screened interval of the newly installed monitoring wells range from Poorly Graded to Gravelly Sand with a USCS classification symbol of SP.

The filter pack for monitoring wells WT114B, WT117B, and WT118B is finer than the recommended range as determined using USEPA's (1975) method. It is not believed that this adversely affected the quality of the ground water samples obtained as the wells were adequately and properly developed, and extremely low turbidities were measured during purging for the ground water sampling.

5.2 Ground Water Flow

Ground water level measurements were collected within an 8-hour period from all monitoring wells at the Himco Site on September 16, 1995 except monitoring well WT104A. The water level in this well was measured seven days later due to problems in obtaining the access agreement in a timely fashion. Table 5-1 presents ground water elevation data derived from these measurements. Based upon this information, two ground water elevation maps have been generated; one for the shallow and one for the intermediate portions of the aquifer (Figures 5-1 and 5-2).

In general, ground water flow as determined during this Pre-Design field investigation is consistent with previous studies. At the time of the water level measurements, ground water occurred from approximately 3 to 16 feet below ground surface at elevations ranging from 751 to 757 feet Mean Sea Level (MSL). Ground water elevations show a relatively flat horizontal hydraulic gradient (average of 0.001 feet/feet) trending south to southeast at both levels in the aquifer (Figures 5-1 and 5-2). Ground water contours for the water table portion of the aquifer show the gradient to vary across the site. This is most likely related to changes in lithology. In

Table 5-1
Results from Site-Wide Water Level Survey
Pre-Design Technical Memorandum
Himco Dump Superfund Site
Elkhart, Indiana

Date	Well Number	TOC Elevation ¹	Depth to Water ²	Water Level Elevation ¹	Well Depth ²	Comments
9/16/95	WTB1	763.65	8.85	754.80	N/A	Well listed as 473' below the ground surface
9/16/95	WTB2	763.18	8.43	754.75	13.14	Debris came up from the bottom.
9/16/95	WTB3	763.28	8.47	754.81	123.81	
9/16/95	WTB4	762.33	7.52	754.81	173.83	PVC broken and cracked. Debris floating on top of water-looks like plants.
9/16/95	WTE1	765.75	14.11	751.64	81.14	No cap or cement pad
9/16/95	WTE3	765.47	13.80	751.67	175.34	No cap
9/16/95	WT01	762.83	11.56	751.27	29.24	
9/16/95	WT101A	764.34	12.76	751.58	18.64	
9/16/95	WT101B	764.23	12.76	751.47	101.04	No concrete pad
9/16/95	WT101C	764.11	12.44	751.67	168.14	

Table 5-1 (Continued)
Results from Site-Wide Water Level Survey
Pre-Design Technical Memorandum
Himco Dump Superfund Site
Elkhart, Indiana

Date	Well Number	TOC Elevation¹	Depth to Water²	Water Level Elevation¹	Well Depth²	Comments
9/16/95	WT102A	769.09	12.55	756.54	18.16	No concrete pad
9/16/95	WT102B	768.82	12.21	756.61	67.49	No concrete pad
9/16/95	WT102C	769.20	12.70	756.50	160.14	No concrete pad
9/16/95	WT103A	762.61	7.34	755.27	18.50	Well and posts not painted
9/23/95	WT104A	765.29	13.72	751.57	18.86	
9/16/95	WT105A	762.58	11.62	750.96	18.61	Well and posts not painted
9/16/95	WT106A	761.50	10.68	750.82	18.54	Well and posts not painted
9/16/95	WT111A	766.45	14.22	752.23	21.80	
9/16/95	WT112A	765.90	11.72	754.18	17.84	
9/16/95	WT112B	766.09	11.94	754.15	62.44	
9/16/95	WT113A	771.85	18.73	753.12	24.69	
9/16/95	WT113B	772.06	18.93	753.13	70.14	
9/16/95	WT114A	769.19	18.01	751.18	24.74	

Table 5-1 (Continued)
Results from Site-Wide Water Level Survey
Pre-Design Technical Memorandum
Himco Dump Superfund Site
Elkhart, Indiana

Date	Well Number	TOC Elevation ¹	Depth to Water ²	Water Level Elevation ¹	Well Depth ²	Comments
9/16/95	WT114B	769.37	18.05	751.32	67.74	
9/16/95	WT115A	765.87	14.35	751.52	19.89	
9/16/95	WT116A	763.86	10.82	753.04	15.06	Odor coming from well
9/16/95	WT116B	763.89	11.60	752.29	60.49	
9/16/95	WT117A	767.19	14.45	752.74	18.14	
9/16/95	WT117B	766.60	13.85	752.75	63.33	
9/16/95	WT118B	766.49	14.20	752.29	65.02	

¹ Feet Mean Sea Level (MSL)

² Feet from Top of Casing (TOC)

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

= 200 FEET
200'

Designed by:
R.J.G.

Drawn by:
J.A.H.

Checked by:
R.J.G.

Reviewed by:
X

Submitted by:

Chief: GEOLOGY A Section

ELKHART, INDIANA

REMEDIAL ACTION

HIMCO DUMP SUPERFUND SITE

GROUND WATER ELEVATION CONTOURS

SHALLOW PORTION OF WATER TABLE AQUIFER

SEPTEMBER 16, 1995

Plot Scale Ratio: 200:1

Design File: EH01G200pg2.dgn

Spec. No.:

DACA 45

Contract No.:

DACA 45

Date:

X

Drawing Code:

X

Sheet
reference
number:

GX.XX

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COMPUTER
AIDED
DESIGN &
DRAFTING

Symbol	Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by:
R.J.G.

Drawn by:
J.A.H.

Checked by:
R.J.G.

Reviewed by:
X

Submitted by:

Chief: GEOLOGY A Section

ELKHART, INDIANA

REMEDIAL ACTION

HIMCO DUMP SUPERFUND SITE

GROUND WATER ELEVATION CONTOURS
INTERMED. PORTION OF WATER TABLE AQUIFER
SEPTEMBER 16, 1995

Plot Scale Ratio: 200:1

Design File: EH01200.dgn

Spec. No.:
DACA 45

Contract No.:
DACA 45

Date:

X

Drawing Code:

X

Sheet
reference
number:

GX.XX

200 FEET
200'

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AIDED
DESIGN &
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particular, the horizontal hydraulic gradient is considerably steeper along the southern boundary of the landfill. In the construction debris area, the log of WT116B indicates the existence of a fine-grained soil of appreciable thickness (interpreted to be approximately 4.7 feet thick) below the water table. This in part may be causing the observed changes in the horizontal hydraulic gradient.

A comparison of water levels between shallow and intermediate aquifer wells WTB2 and WTB3, WT101A and WT101B, WT102A and WT102B, WT111A and WT118B, WT112A and WT112B, WT113A and WT113B, WT114A and WT114B, WT116A and WT116B, and WT117A and WT117B shows little potential for vertical flow of ground water. Elevation head differences ranging from 0.01 to 0.75 feet were noted, with the potential for both upward and downward flow; however, the vertical gradients were noted to be predominantly upward.

5.3 Contaminant Characterization

This section describes the nature and distribution of contaminants detected at the Himco Site. The analytical results of the 1995 ground water monitoring event are summarized first, then a comparative analysis of the 1990-1992 and 1995 ground water monitoring results is provided.

Twenty-four ground water samples were collected at the Himco Site between the dates of September 18 through September 27, 1995. These water samples were analyzed by the Contract Laboratory Program Scope of Work (CLP SOW) methodology for the Full Target Compound List (FTCL). The organic samples were subcontracted to Ross Analytical Services, Inc., 16433 Foltz Industrial Parkway, Strongsville, Ohio, 44136. The inorganic samples were analyzed by American Analytical and Technical Services, 11950 Industriplex Blvd., Baton Rouge, Louisiana, 70809. Table 5-2 summarizes the analytical methods used, and a table correlating the USEPA sample numbers to a particular monitoring well or to a specific purpose (i.e. field quality control) is presented in Table 5-3.

TABLE 5-2					
ANALYTICAL METHODS					
Compound Class	Number of Samples	Matrix	Preparation/ Extraction Method (1)	Analytical Method (1)	Laboratory (2) (3)
Volatile Organics	24	Water	CLP SOW	CLP SOW	Ross
Base/Neutral/ Acids	24	Water	CLP SOW	CLP SOW	Ross
PCB/Pesticide	24	Water	CLP SOW	CLP SOW	Ross
Metals/Cyanide	20	Water	CLP SOW	CLP SOW	American
1 Contract Laboratory Program Scope of Work 2 Ross Analytical Services, Inc. 3 American Analytical and Technical Services					

Table 5-3 USEPA Sample Number to Monitoring Well Correlation Table	
USEPA Sample Number	Monitoring Well
EARR6	WTE1
MEAFJ2	WTE1
EARQ6	WTO1
MEAFH2	WTO1
EARR3	WT101A
MEAFH9	WT101A
EARR3 MS/MSD	WT101A MS/MSD
EARR4	WT101B
MEAFJ0	WT101B
EARR5-DUP	WT101B DUPLICATE
MEAFJ1-DUP	WT101B DUPLICATE
EARP8	WT102A
MEAFG6	WT102A
EARP6	WT102B
MEAFG5	WT102B
EARQ7	WT111A
MEAFH3	WT111A
EARP4	WT112A
EARP4 -MS/MSD	WT112A MS/MSD
MEAFG3	WT112A
EARP5	WT112B
MEAFG4	WT112B
EARP1	WT113A
MEAFG1	WT113A
EARP2	WT113B
MEAFG2	WT113B
EARQ4	WT114A

Table 5-3 USEPA Sample Number to Monitoring Well Correlation Table	
USEPA Sample Number	Monitoring Well
MEAFH1	WT114A
EARQ2	WT114B
MEAFG9	WT114B
EARQ9	WT115A
MEAFH5	WT115A
EARQ1	WT116A
MEAFG8	WT116A
EARQ0-DUP	WT116A DUPLICATE
MEAFG7-DUP	WT116A DUPLICATE
EARQ3	WT116B
MEAFH0	WT116B
EARR0	WT117A
MEAFH6	WT117A
EARR1	WT117B
MEAFH7	WT117B
EARR2	WT118B
MEAFH8	WT118B
EARQ5	TRIP-BLANK
EARR8	TRIP-BLANK
EARP0	TRIP-BLANK
EARP3	TRIP-BLANK
EARR9	TRIP-BLANK
EARP7	TRIP-BLANK
EARP9	TRIP-BLANK
EARS1	TRIP-BLANK
MEAFJ4	SOURCE-WATER
EARS0	SOURCE-WATER

Table 5-3 USEPA Sample Number to Monitoring Well Correlation Table	
USEPA Sample Number	Monitoring Well
EARR7	RINSATE
MEAFJ3	RINSATE
EARQ8	RINSATE
MEAFH4	RINSATE
Note: Sample Numbers should be used when referring to Appendix H (Analytical Data Packages). DUP: Duplicate sample MS/MSD: matrix spike/matirx spike duplicate	

5.3.1 Analytical Results - 1995 Ground Water Sampling Round

Nineteen new and existing monitoring wells had ground water samples collected from them which were analyzed for the following categories of compounds: VOC, SVOC, Metals/Cyanide and PCB/Pesticide by CLP SOW, and the results of these analyses are summarized in Table 5-4 and Figure 5-3. Several water samples had quantifiable or "J" estimated quantities of the following compounds: Methylene Chloride, Acetone, Chloroform, Bis(2-Ethylhexyl)phthalate, Diethylphthalate, and Di-n-butylphthalate. Methylene Chloride, Acetone, and Chloroform are common laboratory contaminants according to Appendix VII of the USEPA Guidance for Data Usability in Risk Assessment, and these compounds are frequently detected in VOCs. The trip blanks associated with sampling events between the dates of September 25 through September 27, 1995 were contaminated with Methylene Chloride and low levels of Acetone. The trip blanks associated with sampling events between the dates of September 18 through September 25, 1995 were contaminated with Methylene Chloride and low levels of Chloroform. The phthalates (Bis(2-Ethylhexyl)phthalate, Diethylphthalate, and Di-n-butylphthalate) according to Appendix VII of the USEPA Guidance for Data Usability in Risk Assessment are also commonly known to be laboratory contaminants detected in SVOC analysis, and these phthalates were detected in the SVOCs method blanks. Finding Methylene Chloride, Acetone, Chloroform, Bis(2-Ethylhexyl)phthalate, Diethylphthalate, and Di-n-butylphthalate in both the Quality Control Samples (the Method-Blanks or the Trip-Blanks) and the environmental samples near the same low-levels suggests that laboratory contamination was the cause of the Methylene Chloride, Acetone, Chloroform, Bis(2-Ethylhexyl)phthalate, Diethylphthalate, and Di-n-butylphthalate detections in the environmental samples. As most of these detections did not exceed the criteria of Appendix VII of the USEPA Guidance for Data Usability in Risk Assessment, they were "U" qualified and not considered further. Other compounds not considered common laboratory contaminants by Appendix VII of the USEPA Guidance for Data Usability in Risk Assessment were found in the trip blanks and the rinsate blanks. Several compounds were found in the rinsate blanks: Methylene chloride, Acetone, Chloroform, Bromodichloromethane, and 1,2 - Dichloropropane. The environmental samples from monitoring well WT116A and the source-water also yielded detections for Bromodichloromethane at a level near that found in the rinsate

blank; therefore, these results are "U" qualified. Monitoring well WT116A also yielded 1,2 - Dichloropropane at similar levels as those found in the rinsate blanks, so these results are "U" qualified as well. One trip blank (EARR9) yielded a detection of 4-Methyl-2-pentanone. None of the environmental samples yielded a similar analyte; therefore, no environmental sample data qualification was necessary. SVOC samples from monitoring wells WTO1 and WT101A yielded quantifiable levels of phthalate compounds, which are commonly attributed to laboratory contamination, and these results were not qualified by the Laboratory or the USEPA data validation as exceeding the criteria of Appendix VII of the USEPA Guidance for Data Usability in Risk Assessment. Phthalates are commonly detected in SVOC analyses, because phthalates are used as plasticizers in the many types of plastic laboratory equipment that SVOC samples may contact during SVOC sample collection, extraction, preparation, and analysis. These same types of phthalate plasticizers and plastics used in laboratories are also utilized in other common commercial consumer products, and as the Himco Dump site is a landfill, such phthalate containing plastics may have been disposed of here. This means that plastics in the landfill may potentially provide a non-laboratory source of the phthalates detected in the SVOC analyses. Further monitoring of the groundwater is necessary to conclusively determine the true source (site contamination or laboratory contamination) of the phthalates detected. Nonetheless, as the site history suggests that a source of phthalates was disposed of at the Himco Superfund Dump Site, all of the non-qualified phthalate results are presented in Figures 5-3 and 5-4 and in Tables 5-4 and 5-5, and these phthalate findings will be discussed. Several ground water samples analyzed for metals and cyanide were "B" ("J" estimated) qualified because the preparation blanks, rinsate blanks, and continuing laboratory blanks were contaminated with a variety of metals, including: Aluminum, Barium, Magnesium, Manganese, Potassium, Vanadium, Zinc, Beryllium, Calcium, Chromium, Copper, Iron, Lead, Nickel, and Silver. The levels of these metal contaminants typically were at a parts per billion level and were below the maximum contaminant levels (MCLs). The source-water used for all drilling and decontamination purposes was analyzed for metals/cyanide, SVOCs, VOCs, and Pesticides/PCBs. The metals analysis yielded Barium (27.2 B $\mu\text{g/L}$) and Manganese (5.9 B $\mu\text{g/L}$), and the results of the other analyses produced non-detect results.

VOC analysis results were below quantitation limits for every sample except for the sample and field duplicate sample collected from monitoring well WT116A, for which the VOC analytical results yielded quantifiable levels of benzene (15 $\mu\text{g/L}$ and 14 $\mu\text{g/L}$, respectively). Additionally other compounds were detected in this sample and field duplicate taken from monitoring well WT116A at levels below the quantitation limit, and they were "J" (estimated concentration) qualified. These compounds were TCE (0.8 J, 0.9 J), 1,2 Dichloroethene (total) (1 J, 1 J), 1,1 Dichloroethane (7 J, 7 J), and Chlorobenzene (0.7 J, 10 U). Other VOC samples yielded "J" (estimated quantitation) results showing that Benzene, 1,2 Dichloroethene (total), 1,1 Dichloroethane, and Chloroethane are present but at concentrations less than the quantitation limit (see Table 5-4 and Table 5-5).

Table 5-4

**1995 Analytical Data Summary for Ground Water Samples
Himco Dump Superfund Site**

Monitoring Well Number	WT116A-DUP	WT116A	WT114B	WT114A	WT115A
Pesticides/PCB (µg/L)	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds (µg/L)			ND	ND	
Dibenzofuran	2 J	2 J	10 U		10 U
Fluorene	3 J	3 J	10 U		10 U
Anthracene	10 U	0.3 J	10 U		10 U
Carbazole	6 J	6 J	10 U		10 U
Naphthalene	10 U	0.4 J	10 U		10 U
Acenaphthene	3 J	3 J	10 U		10 U
Phenanthrene	0.2 J	0.3 J	10 U		10 U
2-Methylnaphthalene	0.5 J	10 U	10 U		10 U
Butylbenzylphthalate	10 U	10 U	0.2 J		10 U
bis (2-Ethylhexyl)phthalate	10 U	10 U	10 U		0.4 J
VOCs (µg/L)					
1,1 Dichloroethane	7 J	7 J	1 J	5 J	10 U
Methylene Chloride	10 U	10 U	10 U	10 U	1 U
Chloroform	10 U	10 U	10 U	10 U	10 U
1,2 Dichloroethene (Total)	1 J	1 J	1 J	10 U	10 U
TCE	0.8 J	0.9 J	10 U	10 U	10 U
Chlorobenzene	0.7 J	10 U	10 U	10 U	10 U
Carbon Disulfide	10 U	10 U	2 J	0.7 J	10 U
Benzene	14	15	10 U	2 J	1 J

Table 5-4 1995 Analytical Data Summary for Ground Water Samples Himco Dump Superfund Site					
Monitoring Well Number	WT116A-DUP	WT116A	WT114B	WT114A	WT115A
<u>VOC - TICS</u>					
Chlorofluoromethane	7 NJ	7 NJ	6 NJ	U	U
Ether	38 NJ	38 NJ	15 NJ	12 NJ	58 NJ
Dichlorofluoromethane	11 NJ	11 NJ	7 NJ	5 NJ	81 NJ
Monitoring Well Number	Source Water	Rinsate Blank	WT101B-DUP	WT101B	WT101A
Pesticides/PCB (µg/L)	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds (µg/L)	ND	ND	ND	ND	
Di-ethylphthalate					11
VOCs (µg/L)					
1,1 Dichloroethane	10 U	10 U	10 U	10 U	5 J
Methylene Chloride	9 U	2 U	2 U	1 U	0.7 U
Chloroform	6 U	47 U	10 U	10 U	10 U
1,2 Dichloroethene (Total)	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	7 J	6 J	10 U
TCE	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	4 U	7 U	10 U	10 U	10 U
Carbon Disulfide	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	10 U
Chlorofluoromethane	U	U	5 NJ	U	U
Dichlorofluoromethane	U	U	U	20 NJ	U
Ether	U	U	15 NJ	30 NJ	U

Table 5-4 1995 Analytical Data Summary for Ground Water Samples Himco Dump Superfund Site			
Monitoring Well Number	WT117B	Rinsate Blank	WTO1
Pesticides/PCB (µg/L)	ND	ND	ND
Semi-Volatile Organic Compounds (µg/L)	ND	ND	
Bis(2-Ethylhexyl)phthalate			13
VOCs (µg/L)			
1,1 Dichloroethane	10 U	10 U	10 U
Methylene Chloride	1 U	2 U	8 U
Acetone	10 U	7 U	10 U
Chloroform	10 U	16 U	10 U
1,2 Dichloroethene (Total)	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U
TCE	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U
Bromodichloromethane	10 U	2 U	10 U
Dichloropropane	10 U	1 U	10 U
Carbon Disulfide	10 U	10 U	10 U
Benzene	10 U	10 U	10 U
<u>VOC - TICS</u>			
Dichlorofluoromethane	U	U	U
Ether	U	U	U
Footnotes for the VOC, SVOC , and Pest/PCB data. ND: Lists of analytes were Non-detects, U: Analyte was non-detect, J: Estimated value			

Table 5-4
Metals (µg/L)
1995 Analytical Data Summary for Ground Water Samples
Himco Dump Superfund Site

Monitoring Well Number	WT114A	WT01	WT111A	WT117A Rinsate	WT113A	WT113B	WT112A
Chromium	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	5.6 B X	4.0 U
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Arsenic	23.3	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Lead	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Manganese	393	205	201	1.2 B X	2.3 B X	148	4.0 B X
Antimony	12.8 U	12.8 U	12.8 U	12.8 U	12.8 U	12.8 U	12.8 U
Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20	0.20 U
Thallium	6.7 B X	4.7 U	4.7 U	4.7 U	4.7 U	5.0 B X	4.7 U
Monitoring Well Number	WT112B	WT102B	WT102A	WT116A Duplicate	WT116A	WT114B	WT116B
Chromium	4.0 U	4.0 U	23.9 X	4.0 U	7.1 B X	4.0 U	4.0 U
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	11.4	10.0 U
Arsenic	3.8 U	4.8 B	3.8 U	3.8 U	3.8 U	18.5	3.8 U
Lead	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Manganese	119	87.3	30.2	696	670	182	203
Antimony	12.8 U	29.7	21.7 B	20.4 B	12.8 U	12.8 U	12.8 U
Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Thallium	4.7 U	13.2 B X	4.7 U	5.5 B X	4.7 U	4.7 U	4.7 U

Table 5-4
Metals (µg/L)
1995 Analytical Data Summary for Ground Water Samples
Himco Dump Superfund Site

Monitoring Well Number	WT117A	WT117B	WTE1	Source Water	WT112A
Chromium	44.2 B	4.0 U	4.0 U	4.0 U	4.0 U
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Arsenic	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Lead	3.4	1.7 U	1.7 U	1.7 U	1.7 U
Manganese	230	61.2	156	5.9 B	4.0 B X
Antimony	2.9 B X	1.9 U	1.9 U	1.9 U	12.8 U
Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Thallium	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U

Footnotes for Metals/Cyanide data.

B: Considered "J" Estimated due to contamination in Preparation or Continuing Calibration Blanks.

X: Sample result is greater than the IDL but less than 5 times the amount found in any blank. These data should be considered as "U" qualified (National Functional Guidelines 1994).

Symbol	Descriptions		Date	Approved
<p align="center">U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS OMAHA, NEBRASKA</p>				
<p>Designed by: R.J.G.</p>	<p align="center">ELKHART, INDIANA REMEDIAL ACTION HIMCO DUMP SUPERFUND SITE 1995 ANALYTICAL RESULTS OF GROUND WATER SAMPLING FIGURE 5-3</p>			
<p>Drawn by: J.A.H.</p>				
<p>Checked by: R.J.G.</p>				
<p>Reviewed by: X</p>	<p>Plot Scale Ratio: 200:1</p>	<p>Date: X</p>	<p>Sheet reference number: GX.XX</p>	
<p>Submitted by:</p>	<p>Design File: CHEM95.DGN</p>	<p>Drawing Code: X</p>		
	<p>Spec. No.: DACA 45</p>			
<p>Chief: GEOLOGY A Section</p>	<p>Contract No.: DACA 45</p>			

SVOC analysis results were below quantitation limits for every sample, except for SVOC samples from monitoring wells WTE1 and WT101A, which showed Bis(2-Ethylhexyl)phthalate at a level of 13 µg/L and Di-ethylphthalate at a level of 11 µg/L, respectively. Monitoring well WT114B yielded a "J" qualified phthalate result of Butylbenzylphthalate 0.2 J µg/L. Most likely these compounds are present in the samples due to laboratory contamination; however, as discussed above there is a possibility they indicate actual site contamination. Further groundwater monitoring is necessary to determine if these phthalate detections are attributable to laboratory contamination or site conditions. Monitoring well WT116A yielded the only non-phthalate SVOC results. The following compounds were detected below the quantitation limit: Dibenzofuran (2 J, 2 J), Fluorene (3 J, 3 J), Anthracene (10 U, 0.3 J), Naphthalene (10 U, 0.4 J), Acenaphthene (3 J, 3 J), Carbazole (6 J, 6 J), Phenanthrene (0.2 J, 0.3 J), and 2-Methylnaphthalene (0.5 J, 10 U), in a sample and field duplicate respectively, collected from monitoring well WT116A.

The pesticide/PCB analyses yielded non-detects results for all samples.

The inorganic analyses for Metals and Cyanide yielded four monitoring wells with Antimony results above the Antimony MCL (6 µg/L) and seven monitoring wells water with Manganese results above the Manganese Secondary MCL (50 µg/L). Antimony was detected in samples obtained from monitoring wells WT102B, WT102A, WT116A, WT116A (field duplicate), WT101B and WT101B (field duplicate) at levels of 29.7 µg/L, 21.7 B µg/L, 12.8 U µg/L, 20.4 B µg/L, 12.8 U µg/L, and 45.5 B µg/L respectively. Manganese was detected in samples obtained from monitoring wells WT114A, WT116A, WT116A (field duplicate), WT115A, WT101A, WT117A, WT117B, WTE1, and in the source water at levels of 393 µg/L, 670 µg/L, 696 µg/L, 413 µg/L, 1060 µg/L, 230 µg/L, 61.2 µg/L, 156 µg/L, and 5.9 B µg/L respectively. Arsenic was detected in samples obtained from monitoring wells WT114A, WT114B, WT102B, and WT101A at levels of 23.3 µg/L, 18.5 µg/L, 4.8 B µg/L, and 7.8 B µg/L respectively. Lead was found a sample taken from monitoring well WT117A at a level of 3.4 µg/L. Chromium was seen in a sample obtained from monitoring well WT117A at a level of 44.2 B µg/L. Cyanide was detected in samples obtained from monitoring well WT114B at a concentration of 11.4 µg/L. The results of the common ground water metals (i.e. Sodium, Calcium, etc.) will not be summarized here. The samples and field duplicates obtained from monitoring wells WT116A and WT101B had some disparities in the Antimony levels reported. The sample and field duplicate from monitoring well WT116A yielded Antimony results of 12.8 U µg/L and 20.4 B µg/L respectively, and the sample and field duplicate results from monitoring well WT101B yielded Antimony levels of 12.8 U µg/L and 45.5 B µg/L respectively. Groundwater turbidity probably does not provide an explanation for the sample and field duplicate disparities, because the turbidity of the groundwater at monitoring wells WT116A and WT101B was 6.3 NTU and <1 NTU respectively.

5.3.2 Comparative Analysis of Ground Water Analytical Results

Presented in Table 5-5 are the levels of contaminants detected as a function of time from the various monitoring wells surrounding the Himco Site. To further aid in the conceptual understanding of the site conditions, the sample results are presented on Figure 5-3 for the 1995 sampling round and in Figure 5-4 for the 1990-1992 sampling round. The ground water

analytical results from the 1990-1992 Remedial Investigation are compared with the September 1995 ground water sampling results in order to quantify any changes in ground water quality related to the Himco Site. For the purposes of this comparison, dissolved metals results from the RI investigation (Volume 4 of the Final RI Report, Donohue, 1992) were compared against data from the 1995 sampling round. Similarly, all other analyses (VOCs, SVOCs, and Pesticides/PCBs) reported in Volume 4 of the Final RI Report were used for comparison against the most current data. As shown in Table 5-4, some compounds that are commonly considered laboratory contaminants (Di-n-octylphthalate, bis(2-Ethylhexyl)phthalate, Methylene Chloride, Acetone, Chloroform) were detected in the 1990-1992 Remedial Investigation's ground water sampling. Low-level detections of these compounds were "J" qualified (estimated concentration), and they are reported along with the other analytical results. However, these compounds may not typify the actual site contaminants, and the detection of similar compounds in the analytical results of the September 1995 data were attributable laboratory contamination and were "U" qualified. Phthalates are commonly detected in SVOC analyses, because phthalates are used as plasticizers in the many types of plastic laboratory equipment that SVOC samples may contact during SVOC sample collection, extraction, preparation, and analysis. These same types of phthalate plasticizers and plastics used in laboratories are also utilized in other common commercial consumer products, and as the Himco Dump site is a landfill, such phthalate containing plastics may have been disposed of here. This means that plastics in the landfill may potentially provide a non-laboratory source of the phthalates detected in the SVOC analyses. Further monitoring of the groundwater is necessary to conclusively determine the true source (site contamination or laboratory contamination) of the phthalates detected. Nonetheless, as the site history suggests that a source of phthalates was disposed of at the Himco Superfund Dump Site, all of the non-qualified phthalate results are presented in Figures 5-3 and 5-4 and in Tables 5-4 and 5-5, and these phthalate findings will be discussed.

Metals: In the 1990-1992 sampling event, upgradient monitoring wells WTB1, WTB2, WTB3, WTB4, WTCP1, WT102A, WT102B, and WT102C and downgradient monitoring wells WTE2, WTE3, WTM1, WTM2, WTN1, WTO1, WTP1, WT101A, WT101B, WT101C, WT103A, WT104A, WT105A, WT106A, and WT111A yielded results for metals. Of this set of wells, WTB1, WTB2, WTB3, WTB4, WTCP1, WTE2, WTE3, WTM1, WTM2, WTN1, WTP1, WT101C, WT102C, WT103A, WT104A, WT105A, and WT106A were not resampled in 1995. During the 1995 sampling event upgradient monitoring wells WT102A, WT102B, WT112B, and WT113B and down gradient monitoring wells WTE1, WTO1, WT101A, WT101B, WT111A, WT114A, WT114B, WT115A, WT116A, WT116B, WT117A, WT117B, and WT118B yielded results for metals.

The upgradient water quality during the 1990-1992 sampling event was determined by the analytical results from monitoring wells WTB1, WTB2, WTB3, WTB4, WTCP1, WT102A, WT102B, and WT102C; several of these monitoring wells were sampled twice or more during 1990-1992. Monitoring wells, WTB1, WTB2, WTB3, WTB4, from the WTB well cluster displayed the following results during the first round of sampling: Manganese (36.1 µg/L), Manganese (2.1 B µg/L) and Selenium (2.3 BJ µg/L), Antimony (63.4 µg/L) and Manganese (439 J µg/L), and Antimony (35.2 B µg/L) and Manganese (144 J µg/L), respectively. The second round of 1990-1992 groundwater sampling yielded for monitoring wells WTB2, WTB3,

and WTB4 Manganese (8.9 BJ $\mu\text{g/L}$), Manganese (359 $\mu\text{g/L}$), and Antimony (13.7 B $\mu\text{g/L}$), Manganese (136 $\mu\text{g/L}$), and Lead (1.90 B $\mu\text{g/L}$), respectively. Monitoring well WTB3 was sampled twice during the 1990-1992 time period. One of the two sets of analyses resulted in the detection of Antimony (63.4 $\mu\text{g/L}$), while the other results were non-detect. These differences may suggest that the elevated levels of Antimony were a sampling artifact possibly related to turbidity. For the monitoring wells WTB2, WTB3, and WTB4 sampled twice during the 1990-1992 sampling event Antimony and Manganese are consistently found in the upgradient groundwater at significant levels above the MCL for Antimony (6 $\mu\text{g/L}$) and the secondary MCL for Manganese (50 $\mu\text{g/L}$). Monitoring well WTCP1 was only sampled once during the 1990-1992 sampling event, and this monitoring well yielded results of Manganese (8.5 B $\mu\text{g/L}$), Selenium (2.1 B $\mu\text{g/L}$), and Mercury (0.20 J $\mu\text{g/L}$). Upgradient monitoring wells WTB1, WTB2, WTB3, WTB4, and WTCP1 were not sampled during the 1995 sampling event. The far upgradient monitoring well cluster WT102 was sampled during the 1990-1992 groundwater sampling event and during the 1995 groundwater sampling event. Monitoring well WT102A was sampled three times during the 1990-1992 sampling event with the following findings: Manganese (5.20 BJ $\mu\text{g/L}$) and Arsenic (1.10 BJ $\mu\text{g/L}$), Manganese 3.7 BJ $\mu\text{g/L}$, and Manganese (8.10 $\mu\text{g/L}$). Monitoring well WT102B was sampled once, and Manganese (115 $\mu\text{g/L}$) was found at a level greater than the secondary MCL of Manganese (50 $\mu\text{g/L}$). Monitoring well WT102C was sampled once during the 1990-1992 sampling event, and the results were non-detects. In 1990-1992 the upgradient groundwater quality was impacted by Manganese at levels above secondary MCLs as determined by the results of monitoring wells WTB3 (439 J $\mu\text{g/L}$), WTB4 (144 J $\mu\text{g/L}$ and 136 $\mu\text{g/L}$), and WT102B (115 $\mu\text{g/L}$) and by Antimony above MCLs as determined by the results of monitoring wells WTB3 (63.4 $\mu\text{g/L}$) and WTB4 (35.2 B $\mu\text{g/L}$ and 13.7 B $\mu\text{g/L}$). Further, Lead, Mercury, Arsenic, and Selenium were also detected at concentrations below MCLs or action levels. For those monitoring wells that were sampled more than once during the 1990-1992 sampling event, these low-level metal detections were not found in the groundwater again, which suggests that these may be anomalous results due possibly to sampling artifacts. Results of the 1995 sampling event, which include the existing monitoring wells WT102A and WT102B and newly the installed monitoring wells WT112A, WT112B, WT113A, and WT113B, yielded the following results Manganese (30.2 $\mu\text{g/L}$) and Antimony (21.7 B $\mu\text{g/L}$), Antimony (29.7 $\mu\text{g/L}$) and Non-detect, Manganese (119 $\mu\text{g/L}$), and Manganese (148 $\mu\text{g/L}$), respectively. A comparison of monitoring wells WT102A and WT102B sampled both in 1990-1992 and the 1995 sampling events shows that Manganese (30.2 $\mu\text{g/L}$ and 87.3 $\mu\text{g/L}$, respectively) continues to be found in the upgradient groundwater at levels exceeding the secondary MCL for Manganese (50 $\mu\text{g/L}$). Additionally, for monitoring wells WT102A and WT102B the 1995 sampling round yielded results of Antimony (21.7 B $\mu\text{g/L}$ and 29.7 $\mu\text{g/L}$, respectively) above the MCL for Antimony (6 $\mu\text{g/L}$). Antimony was previously not found in monitoring wells WT102A and WT102B during the 1990-1992 sampling event, but Antimony was detected in the groundwater during the 1990-1992 sampling event in the WTB monitoring well cluster. The 1995 sampling results from the four upgradient monitoring wells, WT112A, WT112B, WT113A, and WT113B, newly installed to the east of monitoring well cluster WTB demonstrate that Manganese (119 $\mu\text{g/L}$ and 148 $\mu\text{g/L}$) also impacts the upgradient groundwater along the entire norther edge (upgradient) of the Himco Dump site. As evident by the detection of Manganese and Antimony during the 1990-1992 groundwater sampling and the continued detection of Manganese and Antimony during the 1995 groundwater sampling, the ground water quality upgradient of the Himco Site has not changed since the RI sampling event with regards to metals.

The downgradient water quality during the 1990-1992 sampling event was determined by the analytical results from monitoring wells WTE2, WTE3, WTM1, WTM2, WTN1, WTO1, WTP1, WT101A, WT101B, WT101C, WT103A, WT104A, WT105A, WT106A, and WT111A; several of these monitoring wells were sampled twice or more during 1990-1992. Monitoring well cluster WTE's monitoring wells WTE2 and WTE3 displayed the following results Copper (7.6 B $\mu\text{g/L}$), Lead (2.1 BJ $\mu\text{g/L}$), Selenium (2.1 B $\mu\text{g/L}$), and Manganese (9.1 BJ $\mu\text{g/L}$), Antimony (54.0 B $\mu\text{g/L}$), Arsenic (5.3 B $\mu\text{g/L}$), and Manganese (18.2 J $\mu\text{g/L}$), respectively. Monitoring well WTE2 was resampled during the 1990-1992 sampling event and only Lead (1.2 B $\mu\text{g/L}$) was detected. This suggests that the low-level Copper, Manganese, and Selenium detections from the first round of 1990-1992 sampling may be due to sampling artifacts. The levels of Antimony found in the WTB well cluster groundwater samples exceed the Antimony MCL (6 $\mu\text{g/L}$), and some groundwater samples exceeded the secondary MCL for Manganese (50 $\mu\text{g/L}$). The monitoring well cluster WTM was sampled twice during the 1990-1992 sampling event and the first sampling round produced for monitoring well WTM1 and WTM2 Antimony (46.5 B $\mu\text{g/L}$), Selenium (3.0 B $\mu\text{g/L}$), and Manganese (77.6 J $\mu\text{g/L}$) and Manganese (408 $\mu\text{g/L}$), respectively. The second round of sampling at monitoring well cluster WTM showed results of Lead (2.0 BJ $\mu\text{g/L}$) and Manganese 103.0 $\mu\text{g/L}$ for monitoring well WTM1 and results of Manganese (331 $\mu\text{g/L}$) for monitoring well WTM2. For monitoring wells WTM1 and WTM2 Manganese was detected in both 1990-1992 sampling rounds, for WTM1 Antimony was detected during the first sampling but not in the second groundwater sampling. This suggests that sample artifacts may account for the difference in Antimony results. The groundwater levels of Antimony and Manganese exceeded the Antimony MCL (6 $\mu\text{g/L}$) and the secondary Manganese MCL (50 $\mu\text{g/L}$) for some groundwater samples. Monitoring wells WT104A and WT106A were sampled twice during the 1990-1992 sampling event as well. During the first round of the 1990-1992 event at monitoring wells WT106A and WT104A Lead (230 BJ $\mu\text{g/L}$), Manganese (242 $\mu\text{g/L}$), Arsenic (5.40 BJ $\mu\text{g/L}$), and Selenium (3.90 BJ $\mu\text{g/L}$) and Lead (2.3 BJ $\mu\text{g/L}$) and Manganese (6.80 BJ $\mu\text{g/L}$) were detected respectively. The second round of 1990-1992 groundwater sampling at monitoring wells WT104A and WT106A yielded Manganese (5.4 B $\mu\text{g/L}$) and Beryllium (13.2 J $\mu\text{g/L}$), Cadmium (7.0 $\mu\text{g/L}$), Cobalt (17.0 B $\mu\text{g/L}$), Copper (16.6 BJ $\mu\text{g/L}$), Lead (1.4 BJ $\mu\text{g/L}$), Manganese (244 $\mu\text{g/L}$), and Chromium (8.6 BJ $\mu\text{g/L}$). The levels of Manganese detected during both 1990-1992 groundwater sampling for monitoring well WT106A exceeded the secondary MCL for Manganese (50 $\mu\text{g/L}$). Additionally both monitoring wells WT104A and WT106A had low-level detections of metals during the 1990-1992 sampling event, which were not replicated during a second sampling. The most probable cause for these disparities in reported levels is sampling artifacts. Monitoring well WT105A was sampled three times during the 1990-1992 sampling event and yielded Copper (3.70 B $\mu\text{g/L}$), Lead (2.40 BJ $\mu\text{g/L}$), and Manganese (68.20 $\mu\text{g/L}$) in excess of the secondary MCL for Manganese (50 $\mu\text{g/L}$) during the first sampling round, Chromium (4.3 B $\mu\text{g/L}$), Copper (4.90 BJ $\mu\text{g/L}$), Lead (1.5 BJ $\mu\text{g/L}$), and Manganese (21.6 $\mu\text{g/L}$) during the second sampling round, and only yielded Manganese (5.40 B $\mu\text{g/L}$) during the third sampling round. Monitoring well WTP1 was sampled twice during the 1990-1992 sampling event on 23 September 1991 and on 26 September 1991, and the results of the groundwater sampling produced results of Arsenic (15.60 $\mu\text{g/L}$) and Manganese (372.0 $\mu\text{g/L}$) and Manganese (14.80 B $\mu\text{g/L}$), respectively. Monitoring wells WTN1 and WT103A were sampled once during the 1990-1992 sampling event. Monitoring well WTN1 displayed the following results, Manganese (129.00 $\mu\text{g/L}$), Arsenic (1.90 BJ $\mu\text{g/L}$), and Lead (3.00 BJ $\mu\text{g/L}$). Monitoring well WT103A had results of Arsenic (2.30 $\mu\text{g/L}$) and Manganese (102 $\mu\text{g/L}$) in excess of the

secondary MCL for Manganese (50 µg/L), Lead (1.40 B µg/L), and Copper (8.90 B µg/L). Monitoring well cluster WT101 produced Arsenic (10.80 µg/L), Lead 1.70 B µg/L), and Manganese (2070 µg/L) results at monitoring well WT101A, Arsenic (4.20 B µg/L) and Manganese (76.70 µg/L) results at monitoring well WT101B, and Chromium (206 µg/L), Arsenic (8.10 B µg/L), and Manganese (28.80 µg/L) results at monitoring well WT101C. Monitoring wells WT101A and WT101B had Manganese results exceeding the secondary MCL for Manganese (50 µg/L), and monitoring well WT101C showed that Chromium (206 µg/L) was in excess of the Chromium MCL (100 µg/L). The state of the downgradient groundwater during the 1990-1992 time period was impacted by levels of Manganese above the secondary MCL for Manganese and was impacted by levels of Antimony above the Antimony MCL. Low-levels of Selenium, Lead, Arsenic, Beryllium, Cadmium, Cobalt, Copper, and Chromium were also found in some of the 1990-1992 groundwater samples. These low-level metal detections are presented in Table 5-5 and are also presented on Figure 5-4. Results of the 1995 sampling event, which includes the sampling of some of the existing monitoring wells WT101A, WT101B, WTE1, WT111A and WTO1 and the sampling of the newly installed monitoring wells WT112A, WT112B, WT113A, WT113B, WT114B, WT115A, WT116B, WT117A, WT118B, and WTE1 yielded Manganese, Lead, Chromium, Antimony, Arsenic, and Cyanide. Monitoring wells WT101A, WT101B, WT111A, and WTO1 which were sampled during the 1990-1992 sampling event were resampled during the 1995 sampling event. Groundwater samples obtained from monitoring wells WT101A and WT101B during the 1995 sampling event yielded Arsenic (7.8 B µg/L) and Manganese (1060 µg/L) in excess of the secondary MCL for Manganese (50 µg/L), and Chromium (20.6 µg/L) and Manganese (49.3 µg/L), respectively. As reported above, monitoring well WT101A yielded Manganese (2070 µg/L) and Arsenic (10.80 µg/L) during the 1990-1992 sampling; therefore, Manganese is still impacting the downgradient groundwater at levels exceeding the secondary MCL of magnesium (50 µg/L) and Arsenic is still impacting the downgradient groundwater as well. Monitoring well WT101B during the 1990-1992 sampling event yielded Arsenic (4.20 B µg/L) and Manganese (76.70 µg/L) and in the 1995 sampling event Manganese (49.3 µg/L) was detected, so Manganese is still impacting the downgradient groundwater quality. Monitoring well WTO1 produced levels of Manganese (113 µg/L) and Antimony (38.6 B µg/L) during the 1990-1992 sampling event and yielded only a detection of Manganese (205 µg/L) during the 1995 sampling event. At monitoring well WTO1, the downgradient water quality is still being impacted by Manganese at levels exceeding the secondary MCL of Manganese (50 µg/L). Monitoring well WT111A had results for Arsenic (3.10 B µg/L), Chromium (2.90 B µg/L), Manganese (756 µg/L), and Nickel (13.00 µg/L) during the 1990-1992 sampling event, and during the 1995 sampling event Manganese (201 µg/L) was detected. From the results of monitoring well WT111A Manganese is still affecting the downgradient water quality at levels above the secondary MCL of Manganese (50 µg/L). Manganese was the only metal of concern found in monitoring wells WTE1 (156 µg/L), WT117B (61.2 µg/L), WT115A (413 µg/L), and WT116B (203 µg/L) during the 1995 sampling event; all of these Manganese detections are above the secondary MCL for Manganese (50 µg/L). The newly installed monitoring wells WT116A, WT117A, WT118B were sampled during the 1995 sampling event, and yielded Manganese (696 µg/L) at a level exceeding the secondary MCL for Manganese (50 µg/L) and Antimony (20.4 B µg/L) at levels exceeding the Antimony MCL (6 µg/L) for monitoring well WT116A, Chromium (44.2 B µg/L), Lead (3.4 µg/L) and Manganese (230 µg/L) at a level exceeding the secondary MCL for Manganese (50 µg/L) for monitoring

well WT117A, and Chromium (14.4 µg/L) and Manganese (76.9 µg/L) at a level exceeding the secondary MCL for Manganese for monitoring well WT118B. The newly installed monitoring well cluster WT114 has two monitoring wells, which yielded Arsenic (23.3 µg/L) and Manganese (393 µg/L) for monitoring well WT114A and Cyanide (11.4 µg/L), Arsenic (18.5 µg/L), and Manganese (182 µg/L) for monitoring well WT114B. The data for the newly installed well cluster WT114 and monitoring well WT118B is insufficient for assessing changes in water quality that may be related to the Himco Site as these are new data points. In the case of these new monitoring wells, the detection of elevated metals in the ground water that is attributable to the Himco Site warrants further monitoring at these locations. It should be noted that the turbidity of the purge water for monitoring well WT118B surged above 200 NTUs approximately 15 minutes prior to sampling, and that the elevated metals detected from this well may be a sampling artifact. Cyanide was the only newly discovered inorganic, and it was found only during the most current sampling round in 1995. The occurrence of Cyanide is associated with a new monitoring well location (WT114B). Ground water quality downgradient of the Himco Site does not appear to have changed significantly since the RI sampling event with regards to metals. As in 1990-1992, downgradient groundwater levels of Antimony, Arsenic, and Manganese and low lead levels were still being detected in 1995; therefore, the downgradient groundwater quality of the Himco Site does not appear to have changed significantly, since the 1990-1992 RI sampling with respect to metals.

VOCs: In the 1990-1992 sampling event, monitoring wells WTB1, WTB3, WTB4, WTCP1, WTE2, WTE3, WTM1, WTP1, WT101A, WT101B, WT106A, and WT111A yielded VOC results. Of this set of wells, WTB1, WTB3, WTB4, WTCP1, WTE2, WTE3, WTM1, WTP1, and WT106A were not resampled during the 1995 sampling round.

For the purposes of this discussion, VOC compounds that are commonly considered laboratory contaminants and that were "J" (estimated concentration) qualified will not be used in this comparative analysis. These compounds include Acetone, Chloroform, Methylene Chloride, and Hexanone. Samples taken from upgradient monitoring wells WTB1, WTB3, WTB4, and WTCP1 during the RI (1990 -1992 sampling) were found to contain the following compounds: Dibromochloromethane (5 µg/L), Bromodichloromethane (2 J - 6 µg/L), Chloromethane (5 µg/L J), Acetone (27 µg/L), Chloroform (23 µg/L), and 1,1,1 Trichloroethane (8 µg/L J). During the 1990-1992 and 1995 sampling events, background monitoring wells WT102A and WT102B, which are upgradient from the WTB well cluster, failed to yield any VOC detections. Results of the 1995 sampling event for newly installed upgradient monitoring wells WT112A, WT112B, WT113A, and WT113B yielded non-detects. Based on the most recent contoured ground water elevation data (see Figures 5-1 and 5-2), which suggests a southeast flow direction in the vicinity of monitoring wells WTB1 through WTB4 and WTCP1, some or all of the VOCs detected in these wells may be attributable to upgradient sources. Therefore, changes in ground water quality upgradient of the Himco Site with regards to VOCs may not be absolutely determined.

Downgradient monitoring wells that yielded detects of VOCs not attributable to possible laboratory contamination in the 1990-1992 sampling event include WTP1, WT101A, WT101B, WT106A, and WT111A. Contaminants detected and their ranges of values include 1,1-Dichloroethane (3 µg/L J), Benzene (1 to 3 µg/L J), Chloromethane (13 µg/L J), 1,2-

Dichloroethene (5 J - 6 µg/L), and Chloroethane (2 µg/L J). None of the VOCs detected in upgradient monitoring wells WTB1, WTB3, WTB4, and WTCP1 (excluding the possible laboratory contaminant Chloroform) were found in ground water samples from the downgradient monitoring wells in the RI sampling event. Contaminants detected in downgradient monitoring wells from the 1995 sampling event include 1,1 Dichloroethane (1 - 7 µg/L J), Benzene (1 J - 15 µg/L), Chloroethane (6 µg/L J), Carbon Disulfide (0.7 - 2 µg/L J), 1,2 Dichloroethene (1 µg/L J), Bromodichloromethane (2 - 7 µg/L J), Dichloropropane (1 µg/L J), Chloroform (2 µg/L J), and Trichloroethene (0.9 µg/L J). Of the original monitoring wells sampled in 1990-1992 that had VOC detects, monitoring well WT101A showed a repeated occurrence of low levels of 1,1 Dichloroethane (3 µg/L J (1991) - 5 µg/L J (1995)) in the 1995 sampling, and monitoring well WT101B showed a repeated occurrence of Chloroethane (13 µg/L (1991) - 6 µg/L J (1995)). Monitoring well WT116A was newly installed in a downgradient region previously unmonitored in 1990-1992. The VOC results for monitoring well WT116A reveal that the downgradient water in this area is impacted by 1,1 Dichloroethane (7 J µg/L), 1,2 Dichloroethene (total) (1 J µg/L), TCE (0.9 J µg/L), and Benzene (15 µg/L) at a level exceeding the Benzene MCL (5 µg/L). Monitoring wells WTE2 and WT105A further downgradient of monitoring well WT116A showed no VOC contamination during the 1990-1992 groundwater sampling, but these monitoring wells were not resampled in 1995, because monitoring well WTE2 was not suitably constructed and monitoring well WT105A was farther downgradient than was consistent with the project objectives. Further groundwater monitoring at monitoring wells WT116A and WT116B and downgradient of monitoring well WT116A is indicated. It can be shown however, that the overall list of contaminants and their range of levels detected in 1995 from monitoring wells downgradient of the Himco Site are mostly similar to those from the 1990-1992 RI sampling event. This is particularly evident by comparing the 1995 sampling results from monitoring wells WT114A (1,1 Dichloroethane 5 µg/L J, Benzene 2 µg/L J) with the 1990-1992 sampling results of WTP1 (1,1 Dichloroethane 3 µg/L J, Benzene 1 µg/L J) or the 1995 and 1990-1992 results of sampling at WT101A (1,1- Dichloroethane 5 µg/L J) in 1995, 1,1 Dichloroethane 3 µg/L J and Benzene 3 µg/L J in 1990-1992). Based on these observations, it is concluded that the ground water quality downgradient of the Himco Site has not changed significantly since the RI sampling event with regards to VOCs.

SVOCs: In the 1990-1992 sampling event, monitoring wells WTB1, WTB2, WTB4, WTE2, WTM1, WTM2, WTP1, WT104A, and WT106A yielded SVOC analytical results. As discussed above, many phthalates are common laboratory contaminants and are often detected by an SVOC analysis; therefore, the bis(2-Ethylhexyl)phthalate and Di-n-octylphthalate results probably are due to laboratory contamination, as they are not detected at similar levels in the 1990 and 1991 analyses (see Table 5-5). While fluctuations in contaminant levels may be expected due to migration, ground water changes etc., such abrupt changes in findings, as exemplified by the results of monitoring well WTM2 ranging from a non-detect result in November 1990 to the detection of bis(2-Ethylhexyl)phthalate (110 µg/L) in September 1991, or the results of monitoring well WTP1 showing bis(2-Ethylhexyl)phthalate levels of 3 µg/L J on 23 September 1991 to 29 µg/L on 26 September 1991, strongly indicates that these compounds probably are not attributable to site contamination.

Most of the monitoring wells sampled in 1995 were newly installed wells. The SVOC results for the 1995 sampling round show detects in monitoring well WT101A (Di-ethylphthalate 11 µg/L) and monitoring well WT116A (Dibenzofuran 2 µg/L J, Fluorene 3 µg/L J, Anthracene 0.3 µg/L J, Carbazole 6 µg/L J, Naphthalene 0.4 µg/L J, Acenaphthene 3 µg/L J, and Phenanthrene 0.3 µg/L J). Di-ethylphthalate (11 µg/L) and bis(2-Ethylhexyl)phthalate (13 µg/L) were the only non-qualified SVOC results; however, these results are most likely attributable to laboratory contamination. The SVOC compounds detected at the newly installed monitoring well WT116A were all found at low-levels and were "J" qualified. None of these compounds were found at other monitoring wells during the 1995 sampling event, but during the 1991 sampling event, monitoring well WTB2 yielded a low-level "J" qualified detection of Naphthalene (2 µg/L J). No detections of similar compounds were found in any of the upgradient monitoring wells, so the possible source of these SVOCs may be on-site. Monitoring well WT116A was newly installed in a region south of the Himco Site between monitoring wells WT111A and monitoring well cluster WT101. This region was newly sampled for SVOCs and VOCs in the 1995 sampling round, and the VOC analyses also reported contaminants of significant levels at monitoring well WT116A in the construction debris area. The fact that the SVOCs Dibenzofuran, Fluorene, Anthracene, Carbazole, Naphthalene, Acenaphthene, and Phenanthrene detected here are not common laboratory contaminants, and that significant VOC results were also discovered at this monitoring well suggest that this region may be a previously undiscovered area of contamination. The construction debris area may contain higher contamination than previously thought and/or a release may be occurring from the landfill and flowing in the groundwater under the construction debris area. Further ground water monitoring is necessary to confirm the veracity of these low-level SVOC results.

Pesticide/PCBs: All of the 1990-1992 and 1995 pesticide/PCB ground water results were non-detects.

Table 5-5 Analyte Levels as a Function of Time				
Monitoring Well	Metals (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WTB1	Mn 36.1	NA	NA	NA
WTB2	Mn 2.1 B Se 2.3 BJ	NA	Mn 8.9 BJ	NA
WTB3	Sb 63.4 Mn 439 J	NA	Mn 359	NA
WTB4	Sb 35.2 B Mn 144 J	NA	Sb 13.7 B Mn 136 Pb 1.90 B	NA
WTCPI	Mn 8.5 B Se 2.1 BJ Hg 0.20 J	NA	NA	NA
WTD1	NA	NA	NA	NA
WTD2	NA	NA	NA	NA
WTD3	NA	NA	NA	NA
WTE1	NA	NA	NA	Mn 156
WTE2	Cu 7.6 B Pb 2.1 BJ Mn 9.1 BJ Se 2.1 B	NA	Pb 1.2 B	NA
WTE3	Ba 220 Sb 54.0 B As 5.3 B Mn 18.2 J	NA	NA	NA
WTM1	Sb 45.5B Se 3.0 B Mn 77.6 J	NA	Pb 2.0 BJ Mn 103.0	NA
WTM2	Mn 408	NA	Mn 331	NA
WTN1	Mn 129.00 As 1.90 BJ Pb 3.00 BJ	NA	NA	NA
WTO1	Mn 113 Sb 38.6 B	NA	NA	Mn 205

Table 5-5 Analyte Levels as a Function of Time				
Monitoring Well	Metals (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WTP1	NA	NA	26 Sep 91 Mn 14.80 B 23 Sep 91 As 15.60 Mn 372.0	NA
WT101A	As 10.80 Pb 1.70 BJ Mn 2070	NA	NA	As 7.8 B Mn 1060 Pb 1.7 U
WT101B	NA	NA	As 4.20 B Mn 76.70	As 3.8 U Mn 49.3
WT101C	NA	NA	Cr 206 As 8.10 BJ Mn 28.80	NA
WT102A	As 1.10 BJ Mn 5.20 BJ	Mn 3.7 BJ	Mn 8.10 BJ	Mn 30.2 Sb 21.7 B
WT102B	NA	NA	Mn 115	Mn 87.3 As 4.8 B Sb 29.7
WT102C	NA	NA	ND	NA
WT103A	ND	NA	As 2.30 BJ Cu 8.90 B Pb 1.40 BJ Mn 102	NA
WT104A	Pb 2.3 BJ Mn 6.80 BJ	NA	Mn 5.4 B	NA
WT105A	Cu 3.70 B Pb 2.40 BJ Mn 68.20	Cr 4.3 B Cu 4.90 BJ Pb 1.5 BJ Mn 21.6	Mn 5.40 B	NA
WT106A	Pb 2.30 BJ As 5.40 BJ Mn 242 Se 3.90 BJ	Be 13.2 J Cd 7.0 Co 17.0 B Cu 16.6 BJ Pb 1.4 BJ Mn 244 Cr 8.6 BJ	NA	NA

Table 5-5

Analyte Levels as a Function of Time

Monitoring Well	Metals (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WT111A	NA	NA	As 3.10 BJ Cr 2.90 B Mn 756 Ni 13.00 B	As 3.8 U Cr 4.0 U Mn 201 Ni 16.0 B X
NEW WELLS				
WT112A	NA	NA	NA	ND
WT112B	NA	NA	NA	Mn 119
WT113A	NA	NA	NA	ND
WT113B	NA	NA	NA	Mn 148
WT114A	NA	NA	NA	As 23.3 Mn 393
WT114B	NA	NA	NA	CN 11.4 As 18.5 Mn 182
WT115A	NA	NA	NA	Mn 413
WT116A	NA	NA	NA	Mn 670
WT116B	NA	NA	NA	Mn 203
WT117A	NA	NA	NA	Cr 44.2 B Pb 3.4 Mn 230
WT117B	NA	NA	NA	Mn 61.2
WT118B	NA	NA	NA	Mn 76.9

NA: Not applicable or Not sampled during the sampling round, ND: Sampled but Non-detect

For the 1990-1992 Metals/Cyanide data, B: Value reported was less than the CRDL but greater than the IDL, J: Estimated concentration.

For the 1995 Metal/Cyanide data, B: "J" estimated concentration, X: Sample result is greater than the IDL but less than 5 times the amount found in any blank. These data should be considered as "U" qualified (National Functional Guidelines 1994).

Table 5-5 Analyte Levels as a Function of Time				
Monitoring Well	VOCs (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WTB1	Dibromochloromethane 5 Bromodichloromethane 6	NA	NA	NA
WTB2	ND	NA	ND	NA
WTB3	ND	NA	Acetone 27 Chloromethane 5 J Chloroform 26	NA
WTB4	Bromodichloromethane 2 J Chloroform 4 J	NA	Chloroform 23 Bromodichloromethane 2 J Dibromochloromethane 2 J	NA
WTCP1	Methylene Chloride 2 J Chloroform 1 J 1,1,1 Trichloroethane 8 J Dibromochloromethane 2 J	NA	NA	NA
WTD1	NA	NA	NA	NA
WTD2	NA	NA	NA	NA
WTD3	NA	NA	NA	NA
WTE1	NA	NA	NA	ND
WTE2	Hexanone 0.7 J	NA	Chloroform 2 J	NA
WTE3	Hexanone 0.7 J	NA	NA	NA
WTM1	ND	NA	Chloroform 2 J	NA
WTM2	ND	NA	ND	NA
WTN1	ND	NA	NA	NA
WTO1	ND	NA	NA	ND
WTP1	NA	NA	1,1Dichloroethane 3 J Benzene 1 J (23 Sep) Chloroform 6 J (26 Sep)	NA

Table 5-5 Analyte Levels as a Function of Time				
Monitoring Well	VOCs (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WT101A	1,1 Dichloroethane 3 J Benzene 3 J	NA	NA	1,1Dichloroethane 5 J
WT101B	NA	NA	Chloroethane 13 J	Chloroethane 6 J
WT101C	NA	NA	ND	NA
WT102A	ND	ND	ND	ND
WT102B	NA	NA	ND	ND
WT102C	NA	NA	ND	NA
WT103A	ND	NA	ND	NA
WT104A	ND	NA	ND	NA
WT105A	ND	ND	ND	NA
WT106A	Chloroethane 2J 1,2 Dichloroethene (total) 6	1,2 Dichloroethene (total) 5 J	1,1 Dichloroethane 3 J Benzene 3 J 25SEP95 1,2 Dichloroethene (total) 5 J	NA
WT111A	NA	NA	Benzene 1 J	ND
NEW WELLS				
WT112A	NA	NA	NA	ND
WT112B	NA	NA	NA	ND
WT113A	NA	NA	NA	ND
WT113B	NA	NA	NA	ND

Table 5-5 Analyte Levels as a Function of Time				
Monitoring Well	VOCs (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WT114A	NA	NA	NA	1,1 Dichloroethane 5J Carbon Disulfide 0.7 J Benzene 2 J
WT114B	NA	NA	NA	1,1 Dichloroethane 1 J 1,2 Dichloroethene (total) 1 J Carbon Disulfide 2 J
WT115A	NA	NA	NA	Benzene 1 J
WT116A	NA	NA	NA	1,1 Dichloroethane 7 J 1,2 Dichloroethene (total) 1 J TCE 0.9 J Benzene 15
WT116B	NA	NA	NA	ND
WT117A	NA	NA	NA	ND
WT117B	NA	NA	NA	ND
WT118B	NA	NA	NA	ND

Table 5-5 Analyte Levels as a Function of Time				
Monitoring Well	SVOCs (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WTB1	Di-n-octylphthalate 8 J bis(2-Ethylhexyl) phthalate 2 J	NA	NA	NA
WTB2	ND	NA	Naphthalene 2 J bis(2-Ethylhexyl) phthalate 6 J	NA
WTB3	ND	NA	ND	NA
WTB4	bis(2-Ethylhexyl) phthalate 32	NA	bis(2-Ethylhexyl) phthalate 3 J	NA
WTCP1	ND	NA	NA	NA
WTD1	NA	NA	NA	NA
WTD2	NA	NA	NA	NA
WTD3	NA	NA	NA	NA
WTE1	NA	NA	NA	ND
WTE2	ND	NA	Bis(2-Ethylhexyl) phthalate 16	NA
WTE3	ND	NA	NA	NA
WTM1	ND	NA	Bis(2-Ethylhexyl) phthalate 3 J	NA
WTM2	ND	NA	Phenol 2 J bis(2-Ethylhexyl) phthalate 110	NA
WTN1	ND	NA	NA	NA
WTO1	ND	NA	NA	bis (2-Ethylhexyl) phthalate 13
WTP1	NA	NA	3J Bis(2-Ethylhexyl) phthalate 26 Bis(2-Ethylhexyl) phthalate SEP 29	NA
WT101A	NA	NA	NA	Di-ethylphthalate 11
WT101B	NA	NA	NA	ND

Table 5-5 Analyte Levels as a Function of Time				
Monitoring Well	SVOCs (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WT101C	NA	NA	NA	NA
WT102A	NA	NA	NA	ND
WT102B	NA	NA	NA	ND
WT102C	NA	NA	NA	NA
WT103A	ND	NA	NA	NA
WT104A	Diethylphthalate 8 J	NA	Bis(2-Ethylhexyl)phthalate 10	NA
WT105A	ND	ND	ND	NA
WT106A	ND	NA	Bis(2-Ethylhexyl)phthalate 4 J	NA
WT111A	NA	NA	ND	ND
NEW WELLS				
WT112A	NA	NA	NA	ND
WT112B	NA	NA	NA	ND
WT113A	NA	NA	NA	ND
WT113B	NA	NA	NA	ND
WT114A	NA	NA	NA	ND
WT114B	NA	NA	NA	Butylbenzylphthalate 0.2 J
WT115A	NA	NA	NA	bis (2-Ethylhexyl)phthalate 0.4 J
WT116A	NA	NA	NA	Dibenzofuran 2 J Fluorene 3 J Anthracene 0.3 J Carbazole 6 J Naphthalene 0.4 J Acenaphthene 3 J Phenanthrene 0.3 J
WT116B	NA	NA	NA	ND
WT117A	NA	NA	NA	ND
WT117B	NA	NA	NA	ND
WT118B	NA	NA	NA	ND

Table 5-5 Analyte Levels as a Function of Time

Monitoring Well	Pesticides/PCBs (µg/L)			
	NOV/DEC 90	JAN 91	SEP 91	SEP 95
WTB1	ND	NA	NA	NA
WTB2	ND	NA	ND	NA
WTB3	ND	NA	ND	NA
WTB4	ND	NA	ND	NA
WTCP1	ND	NA	NA	NA
WTD1	NA	NA	NA	NA
WTD2	NA	NA	NA	NA
WTD3	NA	NA	NA	NA
WTE1	NA	NA	NA	ND
WTE2	ND	NA	ND	NA
WTE3	ND	NA	NA	NA
WTM1	ND	NA	NA	NA
WTM2	ND	NA	ND	NA
WTN1	ND	NA	NA	NA
WTO1	ND	NA	NA	ND
WTP1	NA	NA	ND	NA
WT101A	ND	NA	NA	ND
WT101B	NA	NA	ND	ND
WT101C	NA	NA	ND	NA
WT102A	ND	ND	ND	ND
WT102B	NA	NA	ND	ND
WT102C	NA	NA	ND	NA
WT103A	ND	ND	ND	NA
WT104A	ND	NA	ND	NA
WT105A	ND	ND	ND	NA
WT106A	ND	ND	ND	NA

Table 5-5 Analyte Levels as a Function of Time				
Monitoring Well	Pesticides/PCBs (µg/L)			
WT111A	NA	NA	ND	ND
NEW WELLS				
WT112A	NA	NA	NA	ND
WT112B	NA	NA	NA	ND
WT113A	NA	NA	NA	ND
WT113B	NA	NA	NA	ND
WT114A	NA	NA	NA	ND
WT114B	NA	NA	NA	ND
WT115A	NA	NA	NA	ND
WT116A	NA	NA	NA	ND
WT116B	NA	NA	NA	ND
WT117A	NA	NA	NA	ND
WT117B	NA	NA	NA	ND
WT118B	NA	NA	NA	ND
<p>The 1990-1992 data in this table was compiled from the raw analytical data published in Volume 4 of the Final Remedial Investigation Report (Donohue, 1992), and the original data qualifiers used in that report are presented along with the data. NA: Not applicable or not sampled, ND: Not detected, J: Estimated Concentration.</p>				

Symbol	Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by:
R.J.G.

Drawn by:
J.A.H.

Checked by:
R.J.G.

Reviewed by:
X

Submitted by:
Chief: GEOLOGY A Section

ELKHART, INDIANA

REMEDIAL ACTION

HIMCO DUMP SUPERFUND SITE

1990-1992 ANALYTICAL RESULTS OF GROUND
WATER SAMPLING
FIGURE 5-4

Plot Scale Ratio: 200:1

Design File: CHEM90.DGN

Spec. No.:
DACA 45

Contract No.:
DACA 45

Date:
X

Drawing Code:

X

Sheet
reference
number:

GX.XX

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chem90.m(4139.geop4) edghjah@geop4. Thu Mar 21 08:51:02 CST 1996

6.0 QUALITY CONTROL SUMMARY

6.1 Sampling Procedures

The procedures detailed in the approved FSP Addendum dated July 1995 were followed as written with a few minor exceptions, which are detailed in Section 4.0 of this document.

6.2 Summary of Daily Quality Control Reports and Field Log Books

Daily Quality Control Reports (DQCRs) were completed for each day of field work in order to document those items pertinent to sampling activities. The Field Log Book documented all field activities performed at the site. A summary of the pertinent information contained in the DQCRs and Field Log Books is provided below.

6.2.1 Work Performed

Field work was initiated at the Himco Site on August 2, 1995 and completed October 20, 1995. The monitoring well development and sampling was completed during this time. Nineteen existing and newly installed monitoring wells were sampled at this site.

6.3 Analytical Procedures

All organic analyses were performed by the Ross Analytical Services, Inc., Strongsville, Ohio using approved EPA CLP SOW analytical procedures. The inorganic analyses were performed by American Analytical and Technical Services, Baton Rouge, Louisiana.

6.4 Quality Control Activities

The Quality Assurance/Quality Control (QA/QC) procedures are briefly described in the following paragraphs. The results of the field and laboratory QC samples, as they pertain to each analytical test, are discussed in Paragraph 6.5.

6.4.1 Trip Blanks

A trip blank accompanied each cooler containing ground water collected for VOC analysis. The trip blank was used to assess contamination from sample container preparation or shipping procedures. The trip blank and associated samples were then transported together to the lab and analyzed for VOCs.

6.4.2 Field Duplicates

Field duplicate samples were collected for this project, but the relative percent differences (RPDs) for organic samples were not calculated by the laboratory.

6.4.3 Surrogate Spikes

Surrogate standards were added to all samples, lab QC samples, and lab blanks analyzed for organic compounds. Surrogates are used to monitor the efficiency of the extraction and/or analysis of the sample within a given matrix. If the recovery of any two volatile surrogates was outside the limits, the sample was reanalyzed. No reanalysis was required for VOCs, PCBs/pesticides, or metals.

6.4.4 Matrix Spikes

Matrix spikes (MS) were analyzed by Ross Laboratory for VOCs, SVOCs and pesticides/PCBs at the frequency of at least one per twenty samples of the same matrix. Matrix recoveries are used to measure analytical bias resulting from sample matrix interferences.

6.4.5 Matrix Spike Duplicates

Matrix spike duplicates (MSDs) were analyzed by Ross Laboratory along with the matrix spike samples. The RPD of MS/MSD pair was used to measure analytical precision.

6.4.6 Laboratory Blanks

Laboratory blanks were used to assess laboratory induced contamination. Laboratory blanks were analyzed at the frequency required by the method.

6.4.7 Laboratory Control Samples

Laboratory control samples (LCSs) were not utilized in this project.

6.4.8 Rinsate Blanks

Rinsate blanks are samples of de-ionized water than are rinsed over decontaminated pieces of sampling equipment, collected, and submitted to the laboratory for analysis. The purpose of rinsate blanks is to assess the effectiveness of equipment decontamination, and to determine the if non-dedicated decontaminated sampling equipment is potentially cross-contaminating samples.

6.5 Data Presentation

6.5.1 Volatile Organic Compounds

6.5.1.1 Holding Times

All samples were analyzed within the specified holding times.

6.5.1.2 Method Blanks

The method blanks were not found to contain any contamination. For every method blank analyzed, the results for all VOC compounds were non-detects.

6.5.1.3 Surrogate Spikes

Surrogate spike recoveries were within acceptable limits.

6.5.1.4 Matrix Spike/Matrix Spike Duplicates

Samples from monitoring well WT112A were chosen to be the MS/MSD samples. All volatile MS and MSD recoveries and RPDs were within the QC limits. All volatile MS and MSD recoveries were well within the QC limits, except for 1,1-Dichloroethene for which the RPD was slightly above the limit. Since this compound was not found in the unspiked sample, no effect on the data quality is expected.

6.5.1.5 Internal Standards

All volatile and semi-volatile internal standard areas were well within the QC limits.

6.5.1.6 Field Duplicates

Field duplicate samples were collected for this project, but the RPDs for organic samples were not calculated by the laboratory.

6.5.1.7 Trip Blanks

Trip blanks were prepared and accompanied every cooler containing VOCs. The results of the trip-blank analysis are presented below in Table 6-1. The trip blanks associated with sampling events between the dates of September 25 through September 27, 1995 (SDG EARR 3) were contaminated with Methylene Chloride and low levels of Acetone. The trip blanks associated with sampling events between the dates of September 18 through September 25, 1995 (SDG EARP0) were contaminated with Methylene Chloride and low levels of Chloroform. Listed below in Table 6-1 is a summary of the trip blank contamination, and the associated environmental samples in which similar analytes are considered "U" (non-detect) qualified on the basis of trip blank contamination.

6.5.1.8 Rinsate Blanks

Rinsate blanks were collected on September 26, 1995 from the two Grundfos pumps (#110 and #220) utilized during the groundwater sampling. The Grundfos pumps were decontaminated and de-ionized water was pumped through them and then collected in order to obtain the rinsate blanks. Listed below in Table 6-1 is a summary of the rinsate blank contamination, and the associated environmental samples in which similar analytes are considered "U" (non-detect) qualified on the basis of rinsate blank contamination.

Table 6-1
Summary of Rinsate and Trip-Blank Contamination
and the Associated Samples Qualified

Sample Identification	Type	Contamination Found in Trip Blanks or Rinsate Blanks					
		Methylene Chloride	Acetone	Chloroform	Bromo-dichloro-methane	1,2-dichloro-propane	4-Methyl-2- Pentanone
EARP0	Trip Blank			0.9 J µg/L			
EARP1	Sample						
EARP2	Sample						
EARP3	Trip Blank			0.9 J µg/L			
EARP4	Sample						
EARP5	Sample						
EARP7	Trip Blank			0.8 J µg/L			
EARP6	Sample						
EARP8	Sample						
EARP9	Trip Blank			0.7 J µg/L			
EARQ1	Sample					4 J µg/L	
EARQ0	Duplicate					4 J µg/L	
EARQ2	Sample						
EARQ4	Sample						
EARQ3	Sample						
EARQ5	Trip Blank	10 µg/L					
EARQ7	Sample	5 J µg/L					

Table 6-1
Summary of Rinsate and Trip-Blank Contamination
and the Associated Samples Qualified

Sample Identification	Type	Contamination Found in Trip Blanks or Rinsate Blanks					
		Methylene Chloride	Acetone	Chloroform	Bromo-dichloro-methane	1,2-dichloro-propane	4-Methyl-2- Pentanone
EARQ6	Sample	8 J µg/L					
EARR8	Trip Blank	2 J µg/L	4 J µg/L				
EARR3	Sample	0.7 µg/L					
EARR5	Duplicate	2 J µg/L					
EARR2	Sample	0.9 J µg/L					
EARR4	Sample	1 J µg/L					
EARQ9	Sample	1 J µg/L					
EARR9	Trip blank	1 J µg/L	4 J µg/L				1 J µg/L
EARR0	Sample	1 J µg/L					
EARR6	Sample	2 J µg/L					
EARR1	Sample	1 J µg/L					
EARQ8	Rinsate Blank	2 J µg/L	7 J µg/L	16	2 J µg/L	1 J µg/L	
EARR7	Rinsate Blank	2 J µg/L	2 J µg/L	47	7 J µg/L	2 J µg/L	
EARQ1	Sample					4 J µg/L	
EARQ0	Duplicate					4 J µg/L	
EARS0	Source Water	9 J µg/L		6 J µg/L	4 J µg/L		

6.5.1.9 Overall Assessment

VOC results are acceptable for project use, and they should satisfy project data quality objectives. A “J” code was assigned for samples where the analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample. Analytes were found in the trip-blanks and rinsate blanks, and such analytes, if they also found in the associated environmental samples at levels less than five times the associated blank contamination, were assessed as being potentially attributable to contamination and were “U” (non-detect) qualified. These data have been validated by USEPA Region V, and they are judged to be of sufficient quality to support the project’s data quality objectives.

6.5.2 Semi-Volatile Organic Compounds

6.5.2.1 Holding Times

All samples analyzed for SVOCs were extracted within the seven-day holding time, and all the extracts were promptly analyzed, except for sample EARS0 (source-water sample). Sample EARS0 was initially extracted along with the other sample, but later failed the QC criteria. Therefore, sample EARS0 was later re-extracted at such a time that it failed the fourteen-day holding period. The laboratory did not provide the original analysis of sample EARS0. Because no target compounds were found in this sample, the USEPA data validators deemed that all the semi-volatile target results must be considered “R” (Unusable) qualified, and the values for the two tentatively identified compounds (TICs) should be considered “J” qualified (estimated).

6.5.2.2 Method Blanks

Some method blanks had bis(2-Ethylhexyl)phthalate and Di-n-butylphthalate contamination. See Table 6-2, below.

Table 6-2
Method Blank Contamination

<u>Sample ID</u>	<u>Compound</u>	<u>Det. Limit</u> <u>(µg/L)</u>	<u>Result</u> <u>(µg/L)</u>
SBLKP1	bis(2-Ethylhexyl)phthalate	10	0.2 J
	Di-n-butylphthalate	10	0.3 J
SBLKP4	bis(2-Ethylhexyl)phthalate	10	0.1 J
SBLKM1	bis(2-Ethylhexyl)phthalate	10	1 J
	Diethylphthalate	10	0.6 J

6.5.2.3 Surrogate Spikes

Surrogate spike recoveries were within acceptable QC limits.

6.5.2.4 Matrix Spike/Matrix Spike Duplicates

The sample from monitoring well WT112A was the source of the MS and MSD samples. All MS and MSD recoveries were within the QC limits except for the recovery of 1,2,4 trichloro-benzene, which was marginally below the lower QC limit. All of the RPDs were within acceptable QC limits. Since 1,2,4 trichlorobenzene was not present in the unspiked sample, the results for 1,2,4 trichlorobenzene in monitoring well WT112A should be considered "UJ" (estimated quantitation limits).

6.5.2.5 Laboratory Duplicate Samples

Laboratory duplicate samples were not reported for this analysis.

6.5.2.6 Field Duplicates

Field duplicate samples were collected for this project, but the RPDs were not calculated by the laboratory.

6.5.2.7 Rinsate Blanks

Rinsate blanks were collected on September 26, 1995 from the two Grundfos pumps (#110 and #220) utilized during the groundwater sampling. The Grundfos pumps were decontaminated and de-ionized water was pumped through them and then collected in order to obtain the rinsate blanks. The rinsate blank results were non-detects.

6.5.2.8 Overall Assessment

Semi-volatile organic results were considered acceptable for project use by a USEPA data validation. A "J" code was assigned for samples where the analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample.

6.5.3 Pesticides/PCBs

6.5.3.1 Holding Times

All samples were analyzed within the specified holding times.

6.5.3.2 Method Blanks

The method blanks were free of contamination.

6.5.3.3 Surrogate Spikes

All surrogate recoveries were within the QC limits, except for decachlorobiphenyl in a duplicate sample (EARQ0) from monitoring well WT116A, and sample EARQ1 from monitoring well WT116A, which were both slightly below the lower QC limit. Since neither of the unspiked samples contained any target analytes, the pesticide/PCB results for samples EARQ0 and EARQ1 should be considered “UJ” (estimated quantitation limits).

6.5.3.4 Matrix Spike/Matrix Spike Duplicates

MS/MSD recoveries were within acceptable QC limits. The RPDs for MS/MSD recoveries were within acceptable QC limits.

6.5.3.5 Laboratory Duplicate Samples

No Laboratory Duplicates were performed for this project.

6.5.3.6 Field Duplicates

Field duplicate samples were collected for this project, but the RPDs were not calculated by the laboratory.

6.5.3.7 Rinsate Blanks

Rinsate blanks were collected on September 26, 1995 from the two Grundfos pumps (#110 and #220) utilized during the groundwater sampling. The Grundfos pumps were decontaminated and de-ionized water was pumped through them and then collected in order to obtain the rinsate blanks. The rinsate blank results were non-detects.

6.5.3.8 Overall Assessment

The pesticide/PCB results are acceptable for project use.

6.5.4 Metals and Cyanide Sample Data Group MEAFG1

6.5.4.1 Holding Times

All samples in Sample Data Group (SDG) MEAFG1 analyzed for metals were extracted within holding times, and all the extracts were promptly analyzed.

6.5.4.2 Preparation Blank and Continuing Calibration Blank

The preparation blank and continuing calibration blank (CCB) results exhibited several metal contaminants (see Table 6-3 below); therefore, these results were “B” qualified (considered estimated concentrations). If similar metals were also found in the associated environmental samples, these results were “B” qualified as well, because of the blank contamination by USEPA data reviewers. Those USEPA “B” qualified metal results that were greater than the IDL but less than five times the amount found in the preparation blank or continuing calibration blanks are further qualified “U” in this report in accord with the review actions promulgated in the guidance document, “USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review” (1994).

Table 6-3
Preparation and CCB Contamination for SDG MEAFG1

<u>Sample ID</u>	<u>Element</u>	<u>Result</u> <u>(µg/L)</u>
Preparation Blank	Al	104.031
	Ba	1.400
	Mg	22.307
	Mn	1.188
	K	80.975
	V	4.507
	Zn	1.188
CCB	Ba	4.4
	Be	0.7
	Ca	77.9
	Cr	8.9
	Cu	7.4
	Fe	12.8
	Pb	2.2
	Mg	41.1
	Mn	2.0
	Ni	10.5
	K	212.1
	Ag	8.4
	V	8.1
	Zn	1.4

6.5.4.3 Matrix Spike and Matrix Spike Duplicate Samples

The samples (MEAFH4S/MEAFH4D) from monitoring well WT117A had RPD values greater than 25%. The duplicate RPDs for these duplicate samples are: Al (60.8%), Ca (200.0%), Fe (47.3%), Mg (200.0%), Ni (200.0%), K (34.4%), Na (44.1%), and Zn (33.3%). These data were not flagged because the duplicate differences did not exceed the technical criteria of \pm Contract Required Detection Limits (CRDL) for water samples.

6.5.4.4 Rinsate Blanks

The two rinsate blanks collected for metals analysis were analyzed as part of SDG MEAFG1. The results of the rinsate blank analyses are presented below in Table 6-4. Those USEPA “B” qualified metal results that were greater than the IDL but less than five times the amount found in the rinsate blanks are further qualified “U” in this report in accord with the review actions promulgated in the USEPA guidance document, “USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review” (1994). All of the metals listed below except for Thallium are also contaminants in the preparation or continuing calibration blanks, so the metals listed in Table 6-3, above, will be “B” qualified on the basis of their discovery in the preparation or continuing calibration blanks. Thallium however was not found in the preparation or continuing calibration blanks, and Thallium results, if the Thallium levels are above the IDL but less than five times the rinsate blank contamination, will be qualified solely on the basis of its detection in rinsate blank MEAFJ3.

6.5.4.5 Overall Assessment

The data were validated by the USEPA and were appropriately qualified. A “B” data qualifier was assigned for samples where the analyte was positively identified, but the associated numerical value is considered as an “J” estimated concentration due to contamination. The metal and the cyanide results are of sufficient quality to support the project’s data quality objectives.

6.5.5 Metals and Cyanide Sample Data Group MEAFH6

6.5.5.1 Holding Times

All samples analyzed for metals were extracted within holding times, and all the extracts were promptly analyzed.

6.5.5.2 Preparation Blank and Continuing Calibration Blank

The continuing calibration blank and preparation blank results also exhibited several metal contaminants (see Table 6-5 below). If similar metals were also found in the associated environmental samples, these results were “B” qualified as well, because of the blank contamination by USEPA data reviewers. Those USEPA “B” qualified metal results that were greater than the IDL but less than five times the amount found in the preparation blank or continuing calibration

blanks are further qualified “U” in this report in accord with the review actions promulgated in the guidance document, “USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review” (1994).

Table 6-4
Rinsate Blank Results

Element	Sample Identification	
Element	MEAFJ3	MEAFH4
Al	116 µg/L	204 µg/L
Cu	10 µg/L	ND
Fe	18.4 µg/L	14.6 µg/L
Mn	1.2 µg/L	1.2 µg/L
Na	307 µg/L	1290 µg/L
Ni	ND	11.2 µg/L
Tl	7.5 µg/L	ND
Zn	4.3 µg/L	3.4 µg/L
K	147	197 µg/L
Mg	49.3	25.8
Ca	138	118
Ba	1.6	ND
ND: Non-detect		

Table 6-5
Preparation and CCB Contamination for SDG MEAFH6

<u>Sample ID</u>	<u>Element</u>	<u>Result</u> <u>(µg/L)</u>
Preparation Blank	Al	104.992
	K	75.972
	Na	435.883
CCB	Al	91.9
	Ba	2.1
	Sb	2.5
	Fe	6.1
	K	84.8
	Na	312.1
	Zn	5.0

6.5.5.3 Matrix Spike and Matrix Spike Duplicate Samples

The samples (MEAFJ4S/MEAFJ4D) obtained from a water main (for the purpose of analyzing the source water) had RPD values greater than 25%. The duplicate RPDs for these duplicate samples are: Al (35.7%), Ba (1.5%), Fe (1.0%), Ca (0.8%), Fe (1.0%), K (2.8%), Mg (0.8%), Mn (1.5%), Na(4.1%), and Zn (23.1%). These data were not flagged, because the duplicate differences did not exceed the technical criteria of \pm Contract Required Detection Limits (CRDL) for water samples.

6.5.5.4 Overall Assessment

The data were validated by the USEPA and were appropriately qualified. A "B" data qualifier was assigned for samples where the analyte was positively identified, but the associated numerical value is considered as an "J" estimated concentration due to preparation or continuing calibration blank contamination. The metal and the cyanide results are of sufficient quality to support the project's data quality objectives.

6.6 Overall Project Data Assessment

The trip blanks associated with sampling events between the dates of September 25 through September 27, 1995 were contaminated with Methylene Chloride and low levels of Acetone. The trip blanks associated with sampling events between the dates of September 18 through September 25, 1995 were contaminated with Methylene Chloride and low levels of Chloroform. Analytes were found in the trip-blanks, and such analytes, if they were also found in the associated environmental samples, were appropriately qualified as being potentially contaminated. These data have been validated by USEPA Region V, and the data are judged to be of sufficient quality to support the

project's data quality objectives.

The SVOC and the Pesticides/PCB data are of sufficient quality to support the project's data quality objectives. The USEPA has also validated all of this data and deemed it acceptable and usable, with the qualifications as described in the above narrative and tables.

The metal and cyanide data are of sufficient quality to support the project's data quality objectives. The preparation blank, the continuing calibration blanks of both SDGs, and rinsate blanks were contaminated with a variety of metals; however, the USEPA Region V data reviewers "B" qualified the analytes in the environmental samples affected by the preparation and continuing calibration blank contamination and deemed their concentrations to be "J" estimated due to the contamination. Metal results that were greater than the IDL but less than five times the amount found in the preparation blank, continuing calibration blanks, or rinsate blanks are further qualified "U" in this report in accord with the review actions promulgated in the guidance document, "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (1994).

7.0 CONCLUSIONS

In general, the Pre-Design field investigation results confirm the findings of the RI in that contaminants in the ground water attributable to the Himco Site continue to migrate off-site. The principal conclusions of the Pre-Design investigation are presented below. Differences between the RI and Pre-Design investigations are noted.

- Measurements from site monitoring wells confirm that the ground water flows roughly in a south to southeast direction in both the shallow and intermediate portions of the water table aquifer.
- Ground water was encountered from approximately 3 to 16 feet bgs at elevations ranging from 751 to 757 feet MSL. The ground water elevations show a relatively flat horizontal hydraulic gradient (average 0.001 feet/feet).
- Ground water quality both up and down gradient of the Himco Site does not appear to have changed significantly since the RI sampling event with regards to Metals, VOCs, SVOCs, and Pesticides/PCBs.
- Metals detected in both the 1990-1992 and 1995 sampling events include Antimony, Arsenic, Chromium, Lead, and Manganese. For each of these metals, a comparison of the results between the RI and current sampling rounds shows similar ranges of concentrations. Manganese and Antimony were found at levels exceeding the Antimony MCL (6 ug/L) and the Manganese Secondary MCL (50 ug/L) in both the 1990-1992 and 1995 ground water sampling events. Cyanide was the only newly discovered inorganic detected in the most current sampling round. The occurrence of Cyanide is associated with a new monitoring well location (WT114B).
- Benzene was detected in ground water from newly installed monitoring well WT116A (in the construction debris area) at 15 ug/L, which exceeds the current MCL of 5 ug/L. This area warrants further ground water monitoring.
- The continued migration of 1,1 Dichloroethane, Benzene, 1,2 Dichloroethene, and Chloroethane with respect to time has been substantiated by low-level detections of these compounds in 1990-1992 and 1995.
- Carbon Disulfide and Trichloroethene were newly detected VOC compounds in the 1995 sampling event. These VOCs were found in the newly installed monitoring wells.
- The 1990-1992 SVOC analyses yielded several detections of phthalates, but none of these detections could be reproduced during repeated sampling. Phthalates were analyzed for in 1995, and sporadic low-level detections of phthalates occurred.

Further monitoring should determine if these phthalate detections are attributable to the landfill or laboratory contamination.

- The 1995 sampling at monitoring well WT116A in the construction debris area yielded several qualified SVOC detections. Such compounds were not detected in the 1990-1992 sampling event. The fact that the SVOCs are not common laboratory contaminants and that significant VOC results were also reported for this monitoring well suggests that this region may contain higher levels of contamination than previously recognized and/or a release is occurring from the landfill and is travelling in the ground water beneath the construction debris area. Further monitoring is recommended.

8.0 REFERENCES

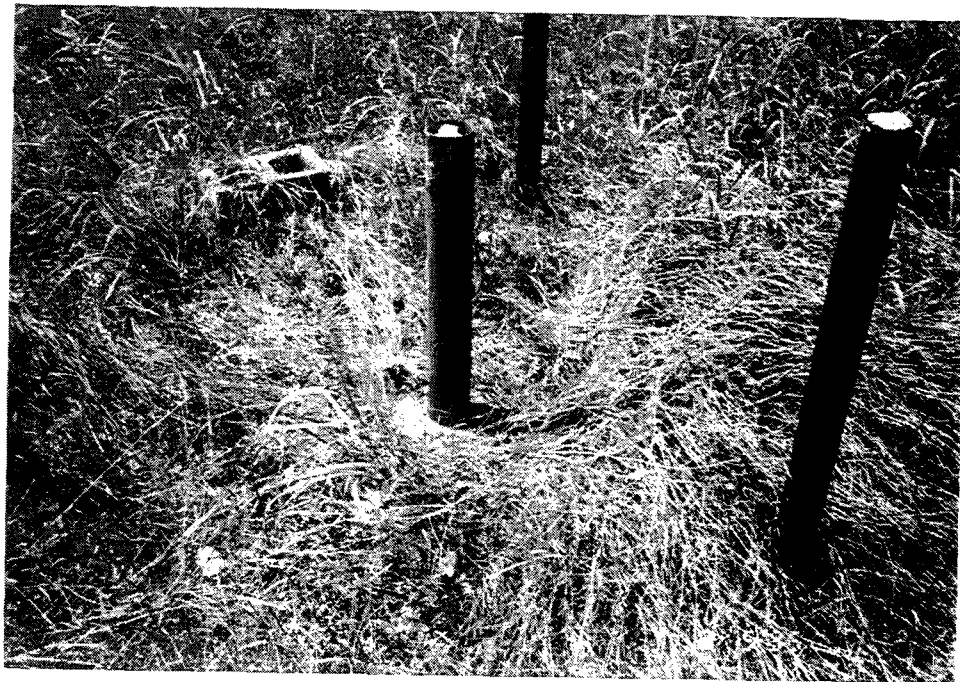
- Duwelius, Richard F. and Silcox, Cheryl A., 1991, Ground-Water Levels, Flow, and Quality in Northwestern Elkhart County, Indiana, 1980-89.
- RUST Environment and Infrastructure, 1995, Addendum to the Final Quality Assurance Project Plan for Remedial Design/Remedial Action Field Activities at the Himco Dump Superfund Site, Elkhart, Indiana.
- SEC Donohue, 1992, Final Remedial Investigation Report, Himco Dump Remedial Investigation/Feasibility Study, Elkhart, Indiana.
- United States Army Corps of Engineers, 1995, 30% Design Analysis, Himco Dump Superfund Site.
- United States Army Corps of Engineers, 1995, Addendum II Field Sampling Plan for Remedial Design/Remedial Action Field Activities at the Himco Dump Superfund Site, Elkhart, Indiana.
- United States Environmental Protection Agency, 1993, Record of Decision, Himco Dump Site, Elkhart, Indiana.
- United States Environmental Protection Agency, 1975, Manual of Water Well Construction Practices, USEPA Office of Water Supply Report No. EPA-570/9-75-001, 156 pp.

APPENDIX A:
PHOTOGRAPHS

PHOTO LOG



Exposure No. 1: View to the southwest of the WT101 monitoring well cluster.



Exposure No. 2: Closeup of monitoring well WT101A.

PHOTO LOG



Exposure No. 3: Closeup of monitoring well WT101B.



Exposure No. 4: Closeup of monitoring well WT101C.

PHOTO LOG



Exposure No. 5: View to the southeast of the WT102 monitoring well cluster.

PHOTO LOG



Exposure No. 6: Closeup of monitoring well WT102A.

PHOTO LOG



Exposure No. 7: Closeup of monitoring well WT102B.



Exposure No. 8: Closeup of monitoring well WT102C.

PHOTO LOG



Exposure No. 9: Closeup of monitoring well WT103A.

PHOTO LOG



Exposure No. 10: Closeup of monitoring well WT104A.



Exposure No. 11: Closeup of monitoring well WT105A.

PHOTO LOG



Exposure No. 12: Closeup of monitoring well WT106A.



Exposure No. 13: Closeup of monitoring well WT111A.

PHOTO LOG



Exposure No. 14: View to the west of the WTB monitoring well cluster.

PHOTO LOG



Exposure No. 15: Closeup of monitoring well WTB1.

PHOTO LOG



Exposure No. 16: Closeup of monitoring well WTB2.

PHOTO LOG



Exposure No. 17: Closeup of monitoring well WTB3.

PHOTO LOG



Exposure No. 18: Closeup of monitoring well WTB4.

PHOTO LOG



Exposure No. 19: Closeup of monitoring well WTCP1.

PHOTO LOG



Exposure No. 20: Closeup of monitoring well WTE1.

PHOTO LOG



Exposure No. 21: Closeup of monitoring well WTE2.

PHOTO LOG



Exposure No. 22: Closeup of monitoring well WTE3.

PHOTO LOG



Exposure No. 23: Closeup of monitoring well WTM1.

PHOTO LOG



Exposure No. 24: Closeup of monitoring well WTM2.

PHOTO LOG

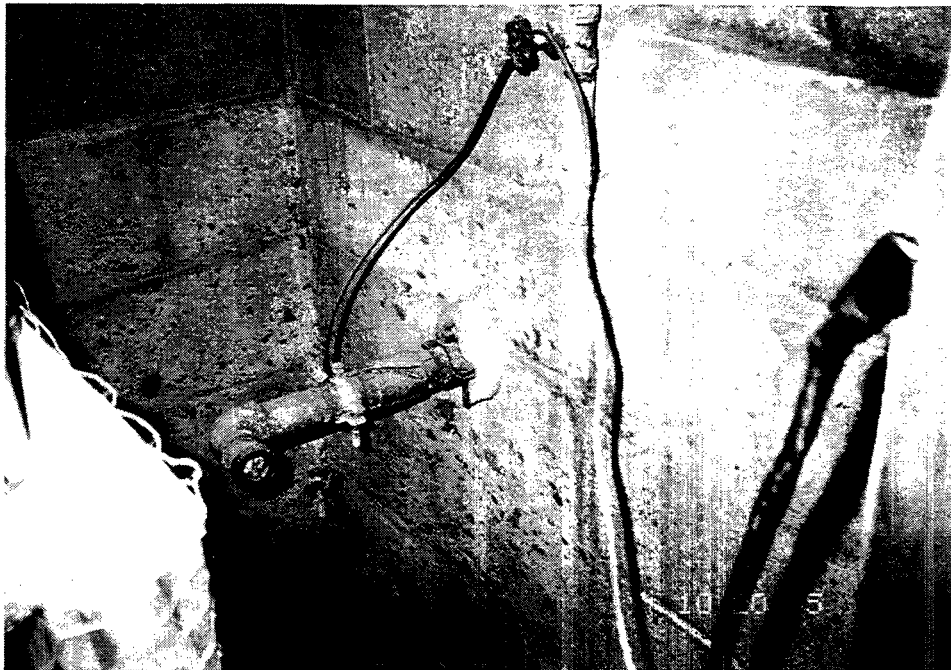


Exposure No. 25: Closeup of monitoring well WTO1.

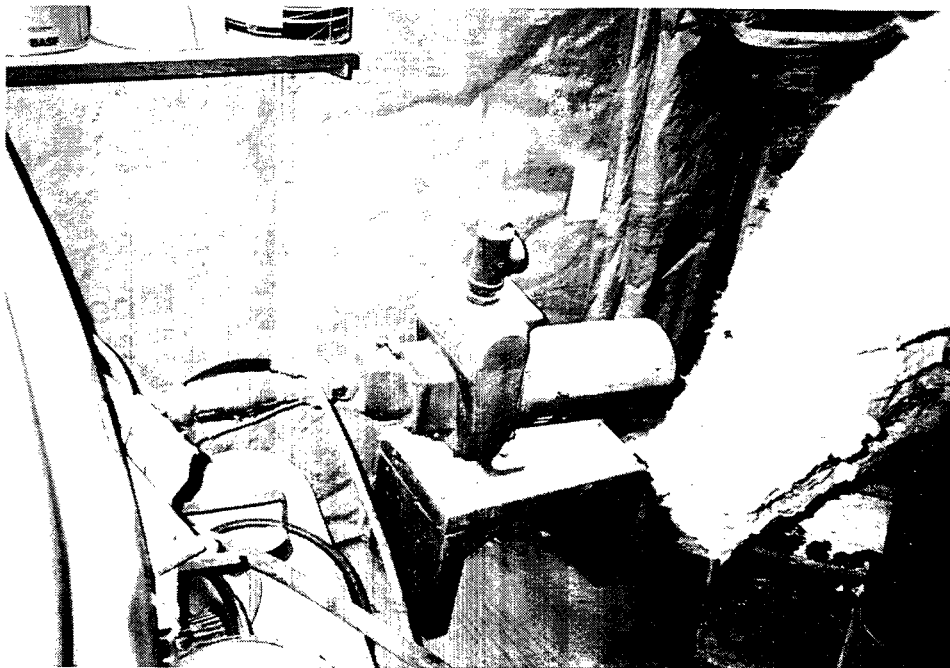


Exposure No. 26: Closeup of monitoring well WTP1.

PHOTO LOG



Exposure No. 27: Closeup of piping in the basement of the Geesaman Residence which is connected to residential well RW-06. Note the newer piping which now conveys city water to the residence.

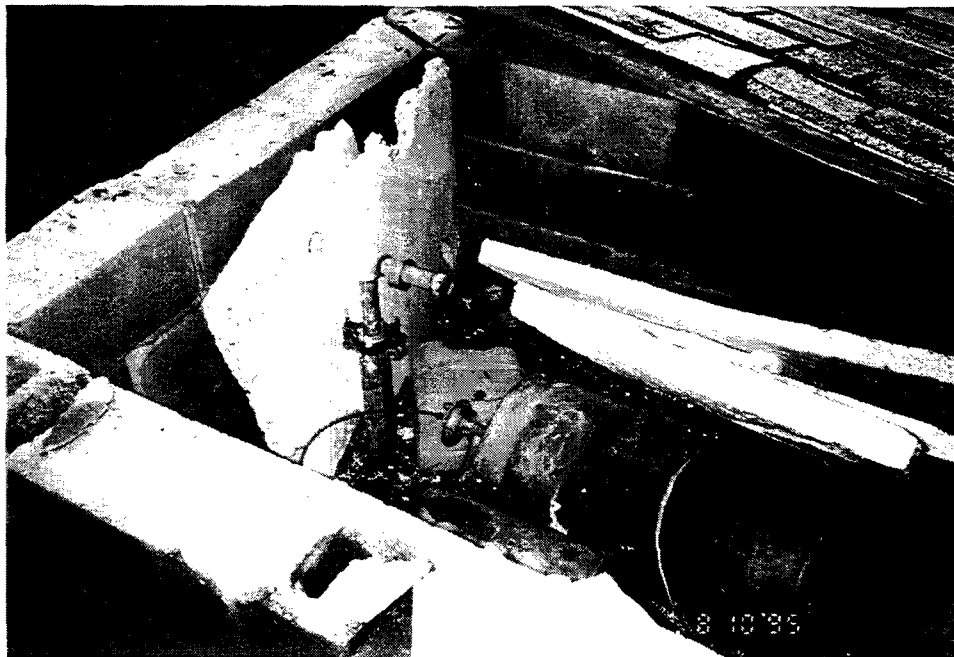


Exposure No. 28: Closeup of pump and piping which is connected to residential well RW-07 (Klein Property). Note that the discharge end of the pump has been disconnected.

PHOTO LOG



Exposure No. 29: Closeup of residential well RW-08 (Bowers Property).



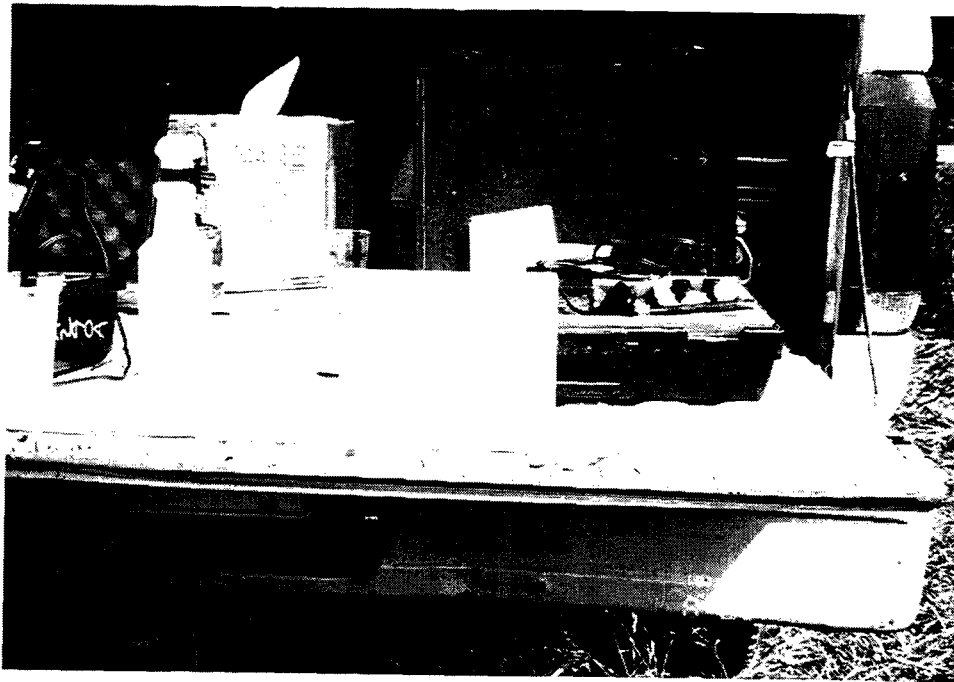
Exposure No. 30: Closeup of residential well RW-09 (Culry Property, formerly owned by Jerry and Kim Watson).

PHOTO LOG

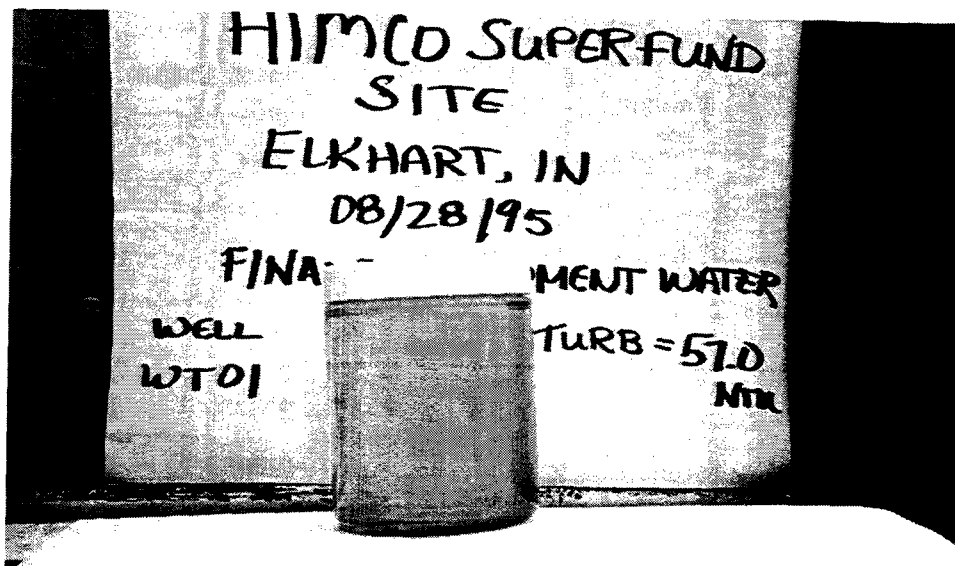


Exposure No. 31: Closeup of residential well RW-10 (Burke Property).

PHOTO LOG



Exposure No. 32: Monitoring well WTE1 final redevelopment water sample.

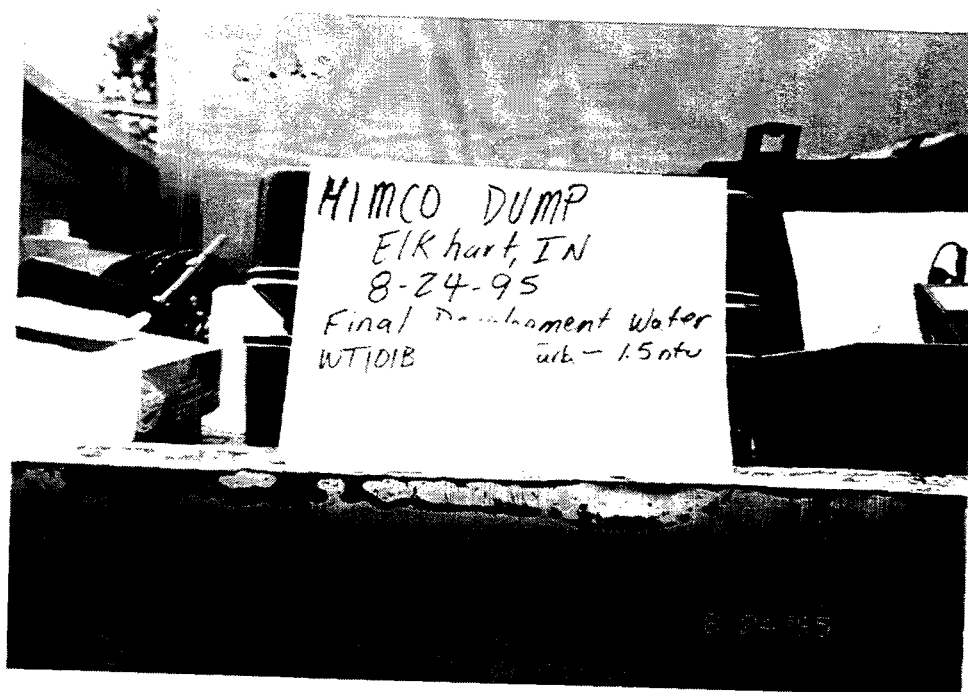


Exposure No. 33: Monitoring well WTE1 final redevelopment water sample.

PHOTO LOG

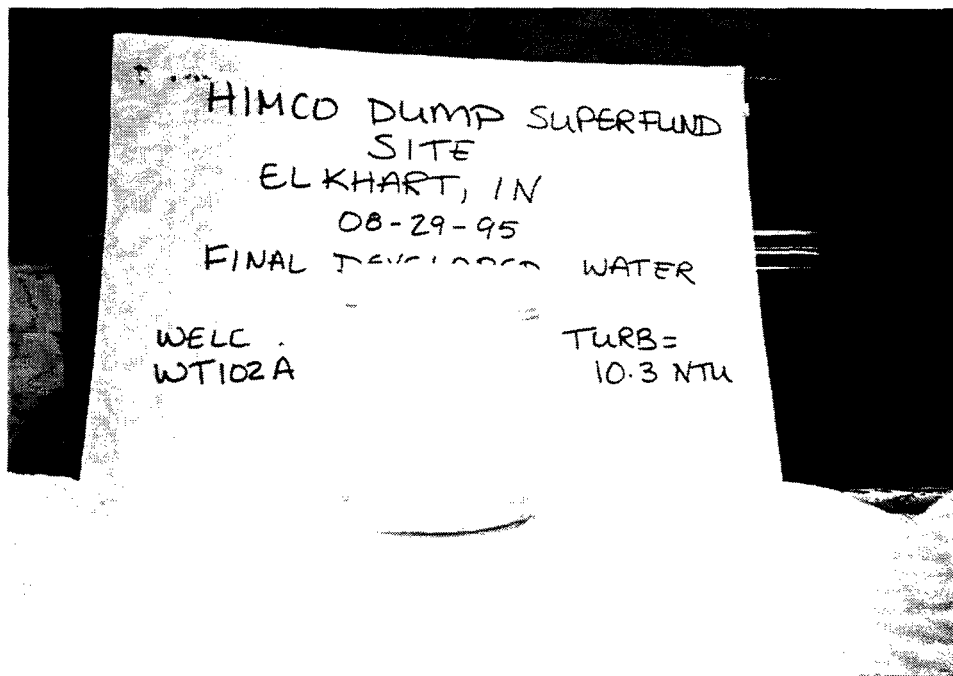


Exposure No. 34: Monitoring well WT101A final redevelopment water sample.

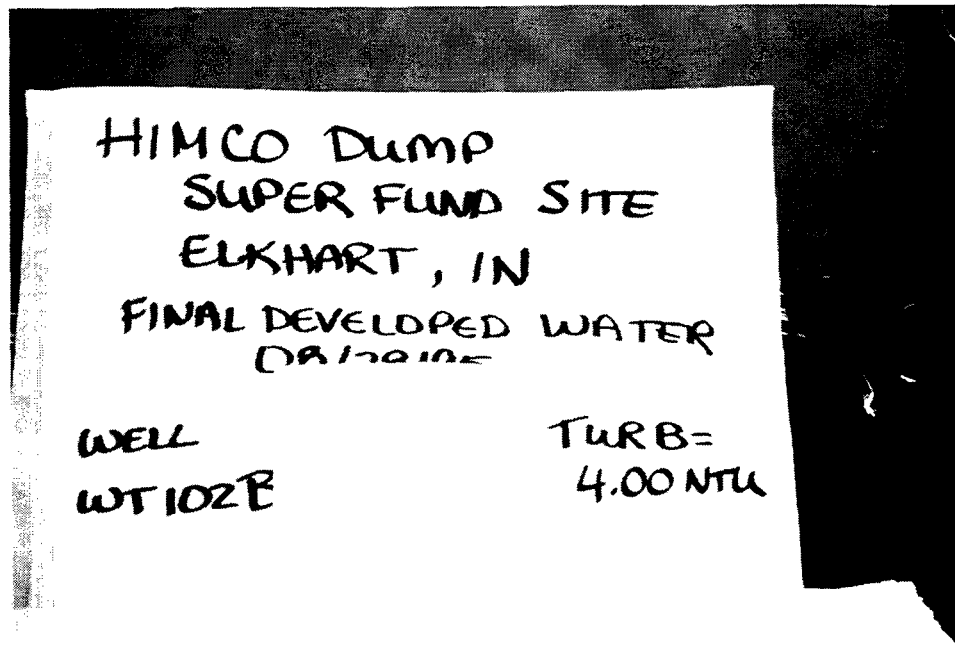


Exposure No. 35: Monitoring well WT101B final redevelopment water sample.

PHOTO LOG

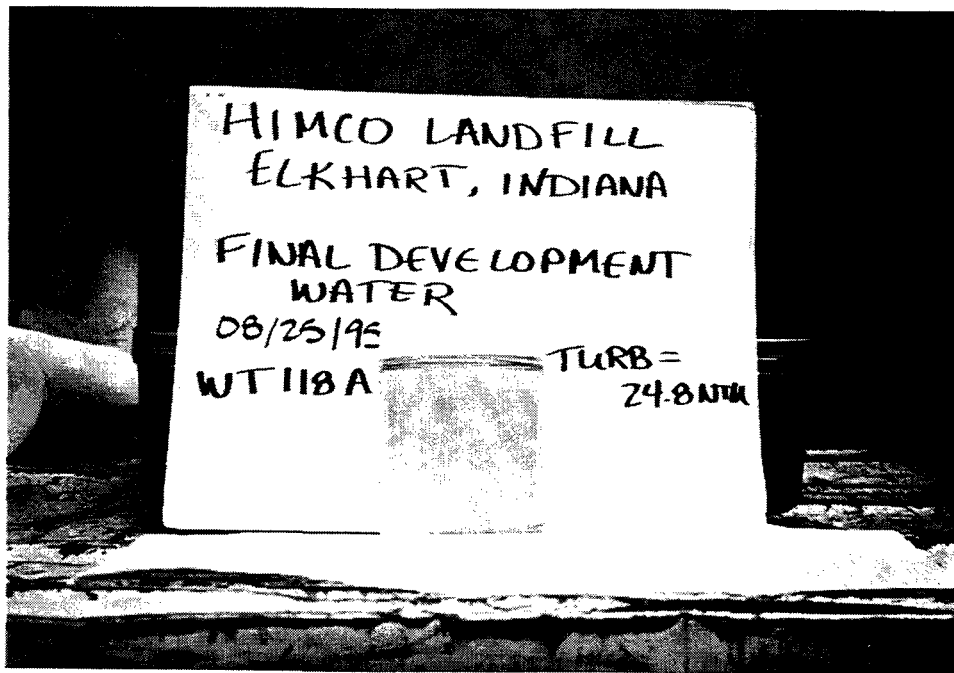


Exposure No. 36: Monitoring well WT102A final redevelopment water sample.

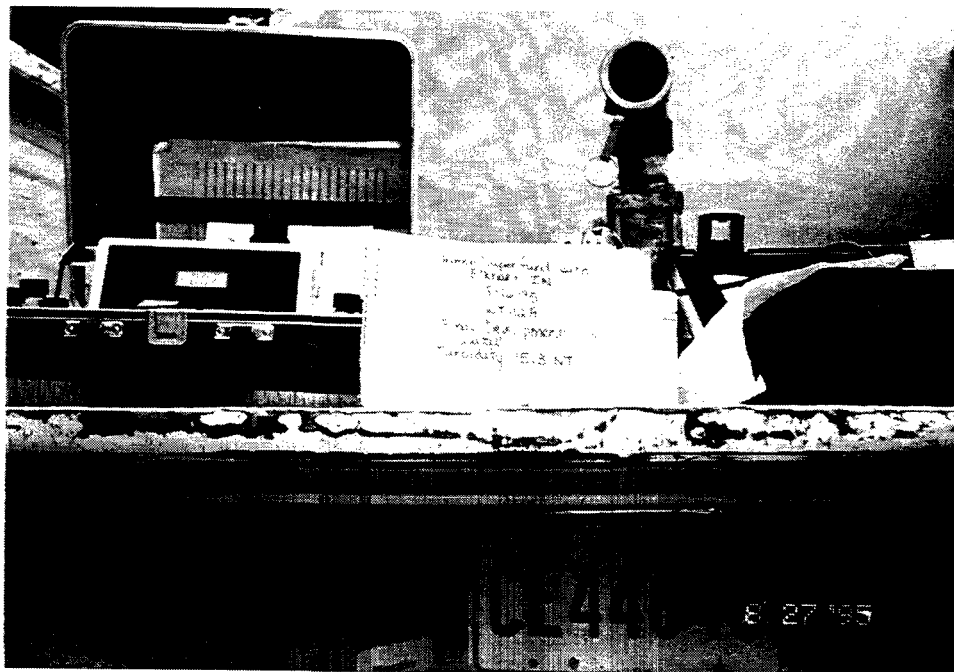


Exposure No. 37: Monitoring well WT102B final redevelopment water sample.

PHOTO LOG

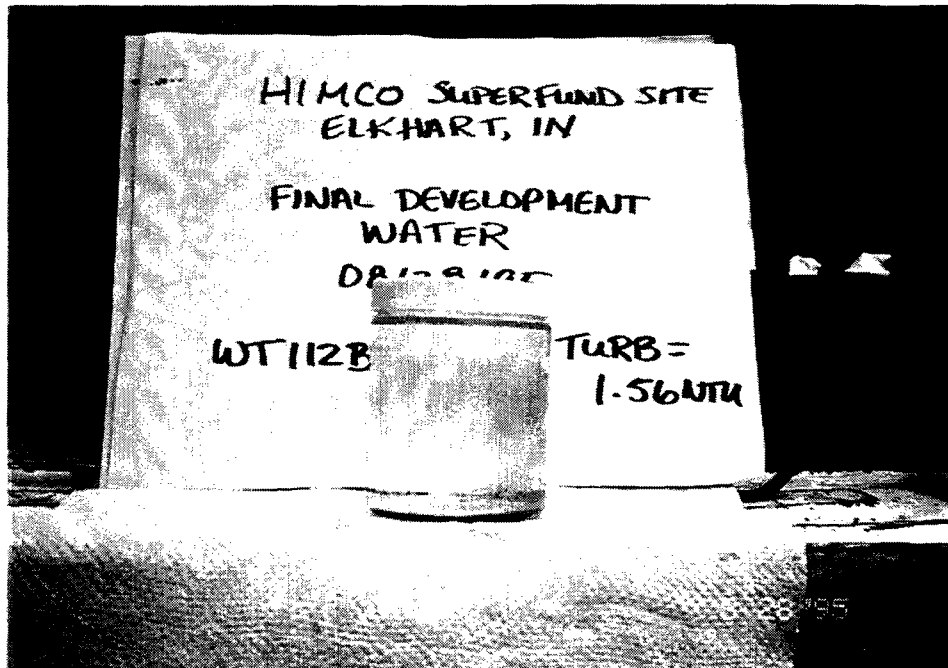


Exposure No. 38: Monitoring well WT111A (mislabelled WT118A) final redevelopment water sample.

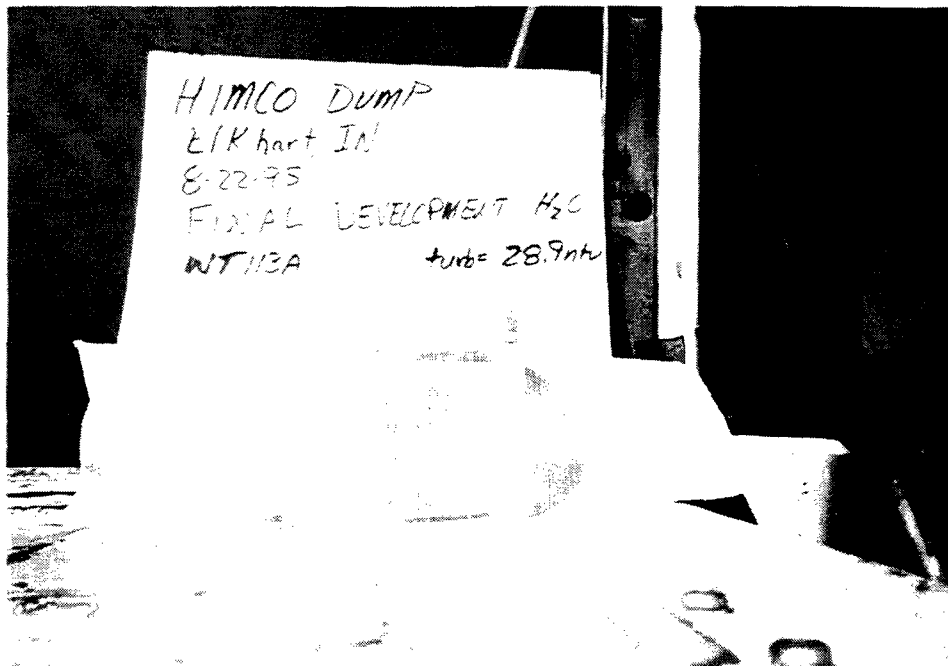


Exposure No. 39: Monitoring well WT112A final development water sample.

PHOTO LOG

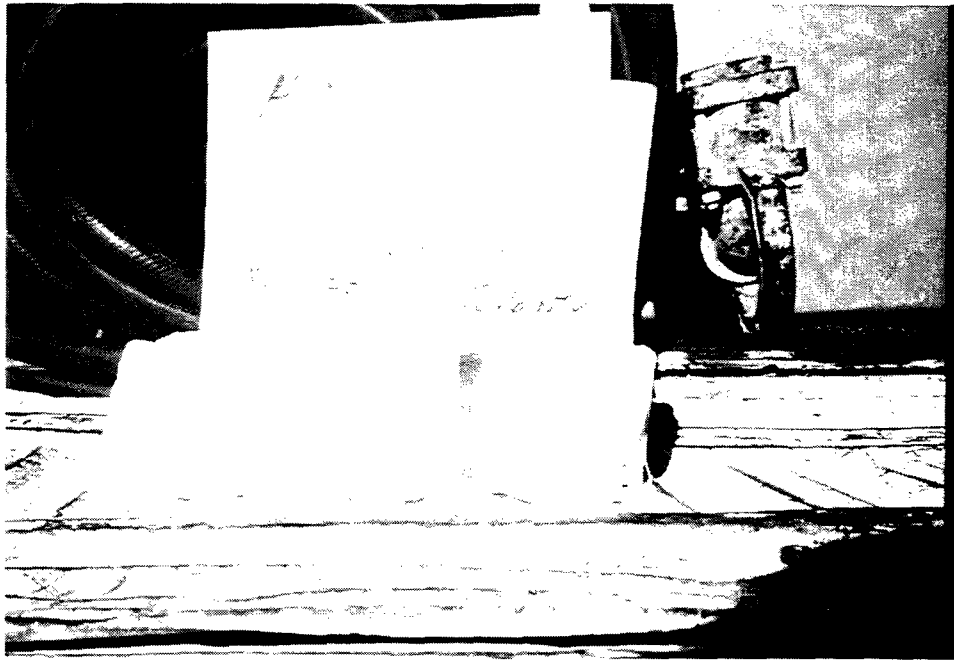


Exposure No. 40: Monitoring well WT112B final development water sample.

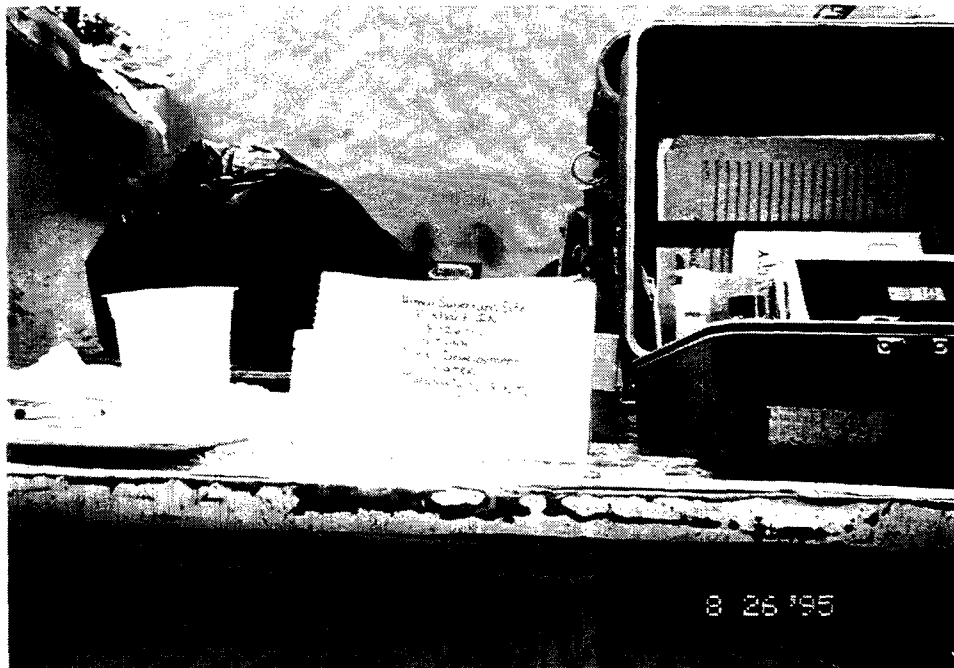


Exposure No. 41: Monitoring well WT113A final development water sample.

PHOTO LOG

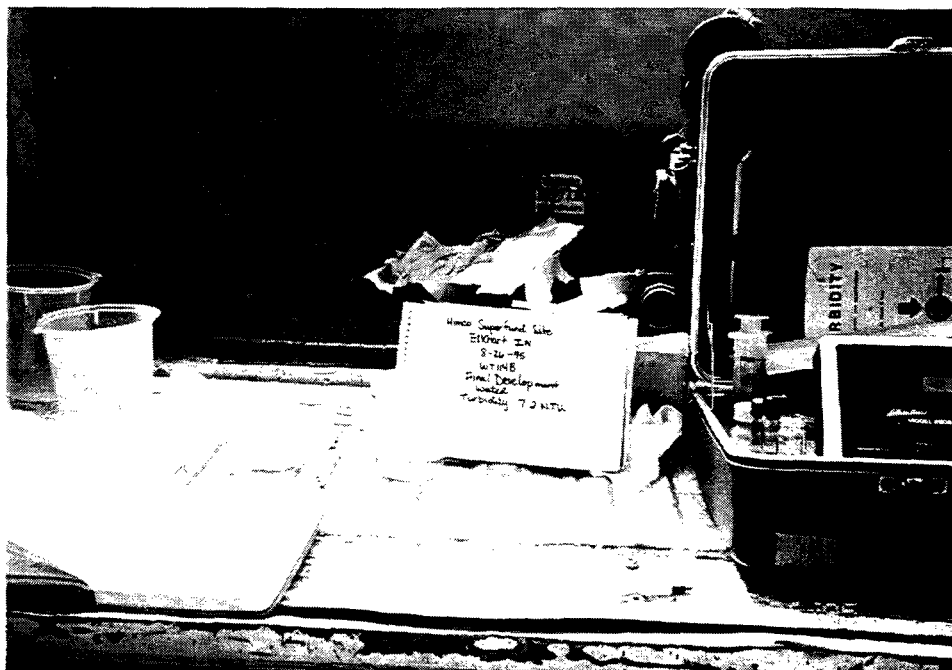


Exposure No. 42: Monitoring well WT113B final development water sample.

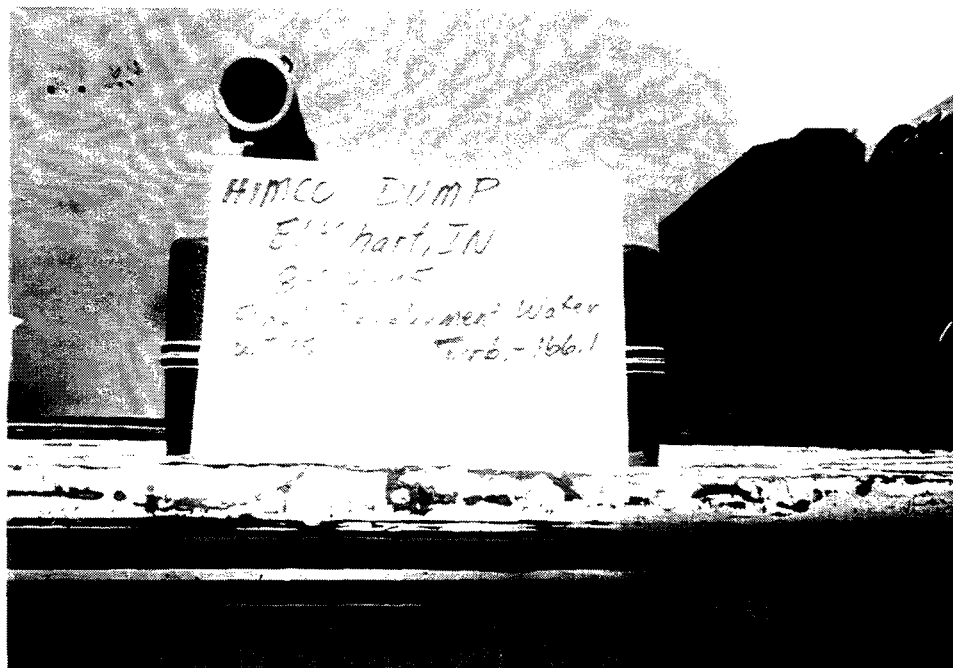


Exposure No. 43: Monitoring well WT114A final development water sample.

PHOTO LOG

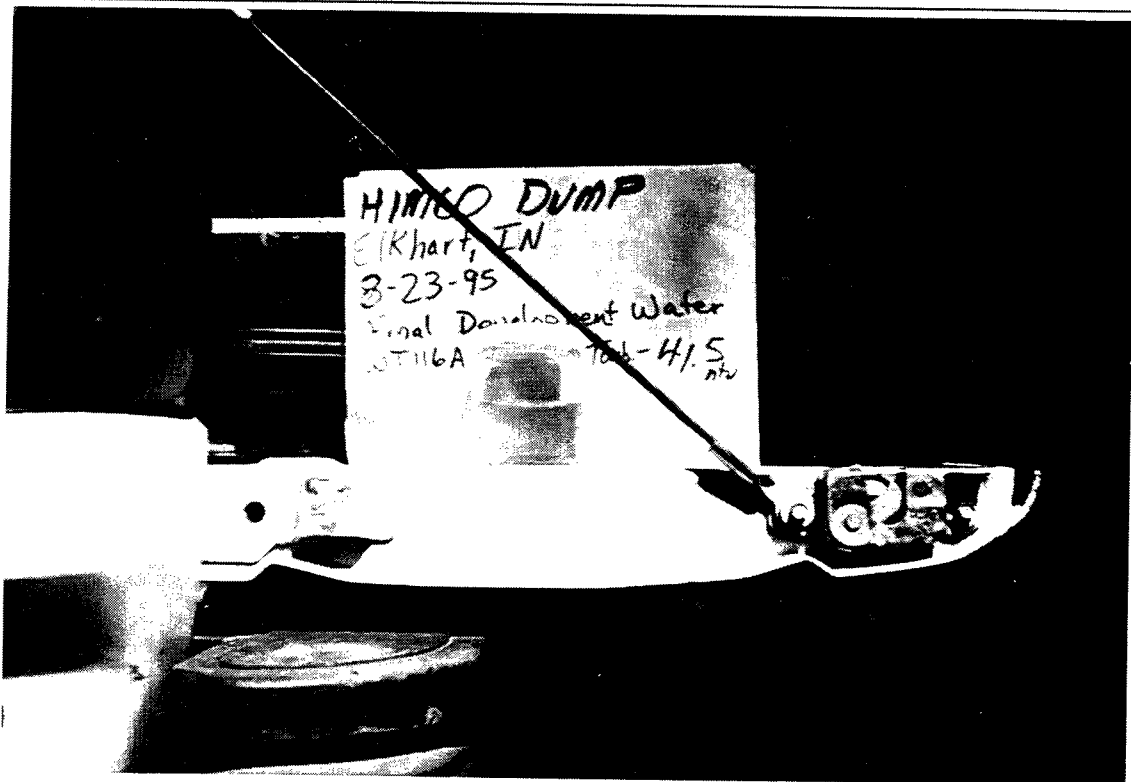


Exposure No. 44: Monitoring well WT114B final development water sample.

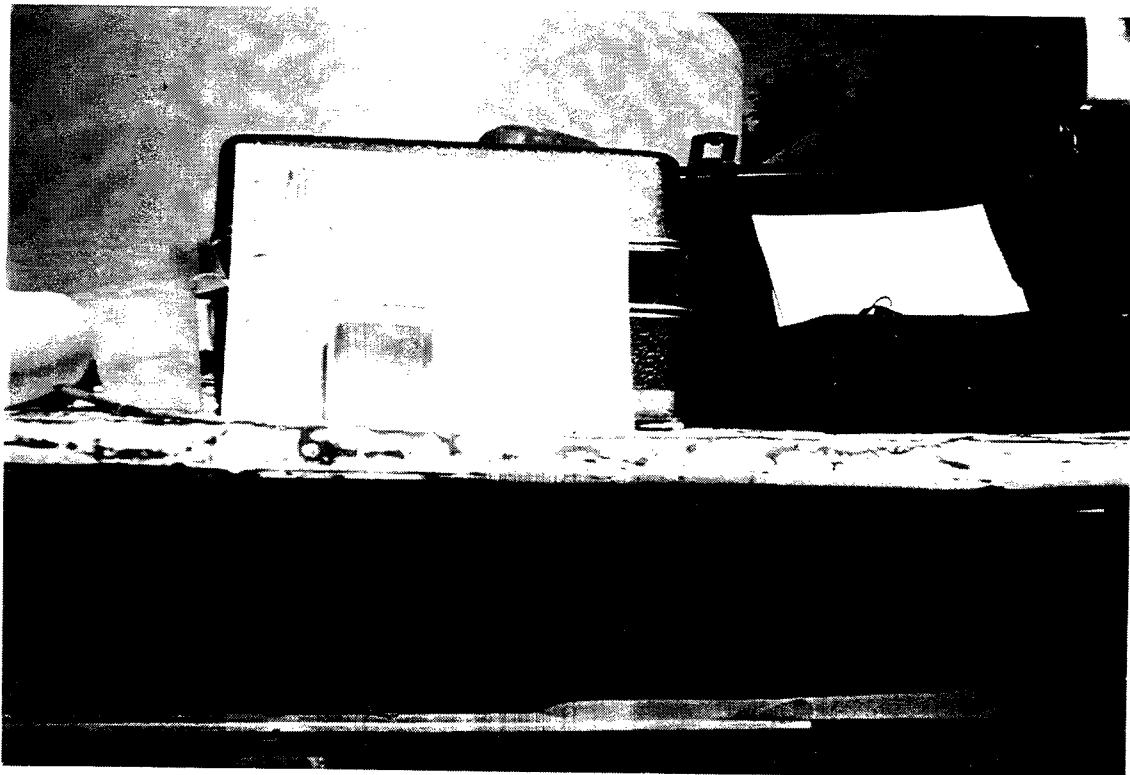


Exposure No. 45: Monitoring well WT115A final development water sample.

PHOTO LOG

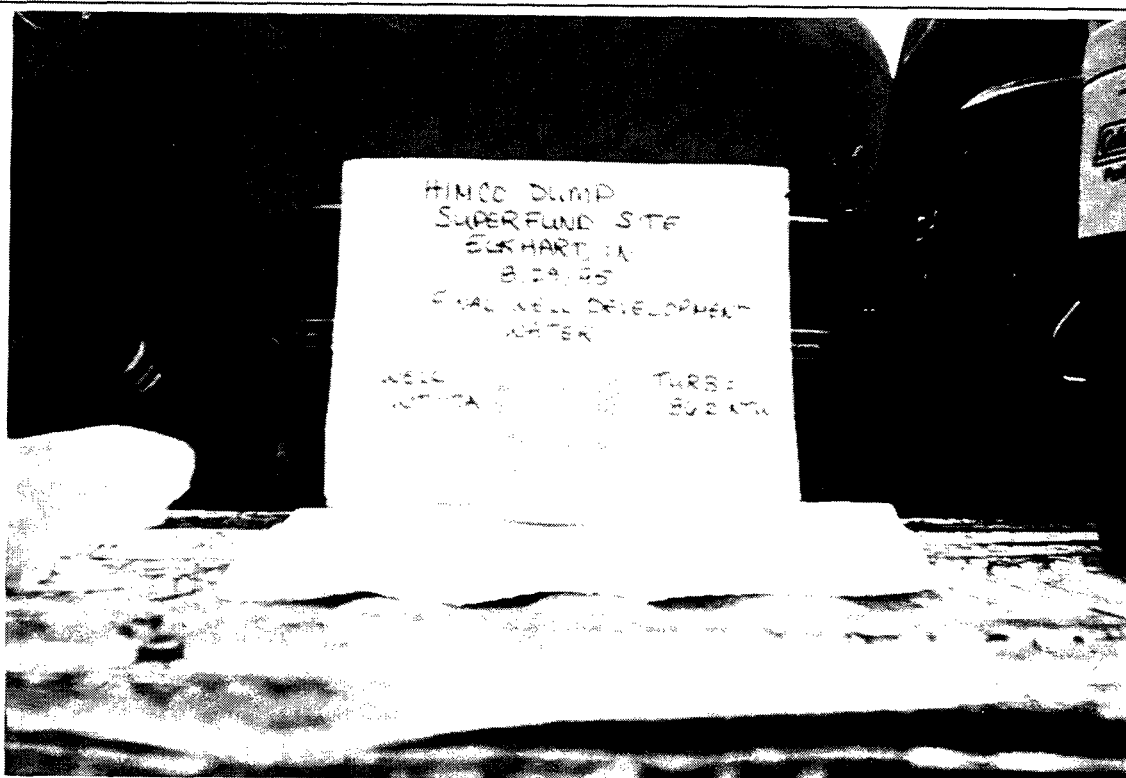


Exposure No. 46: Monitoring well WT116A final development water sample.

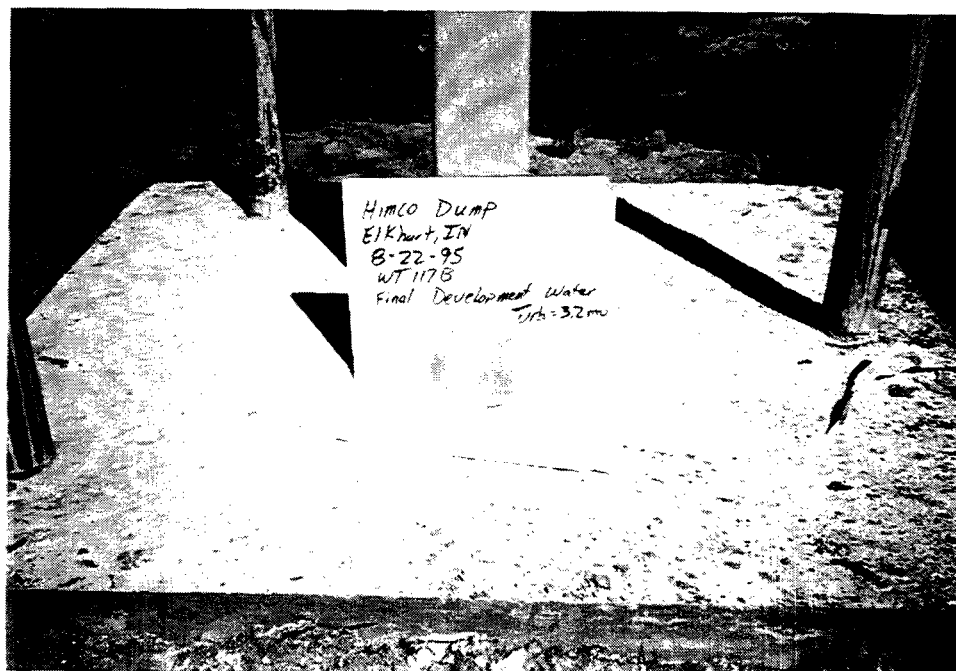


Exposure No. 47: Monitoring well WT116B final development water sample.

PHOTO LOG

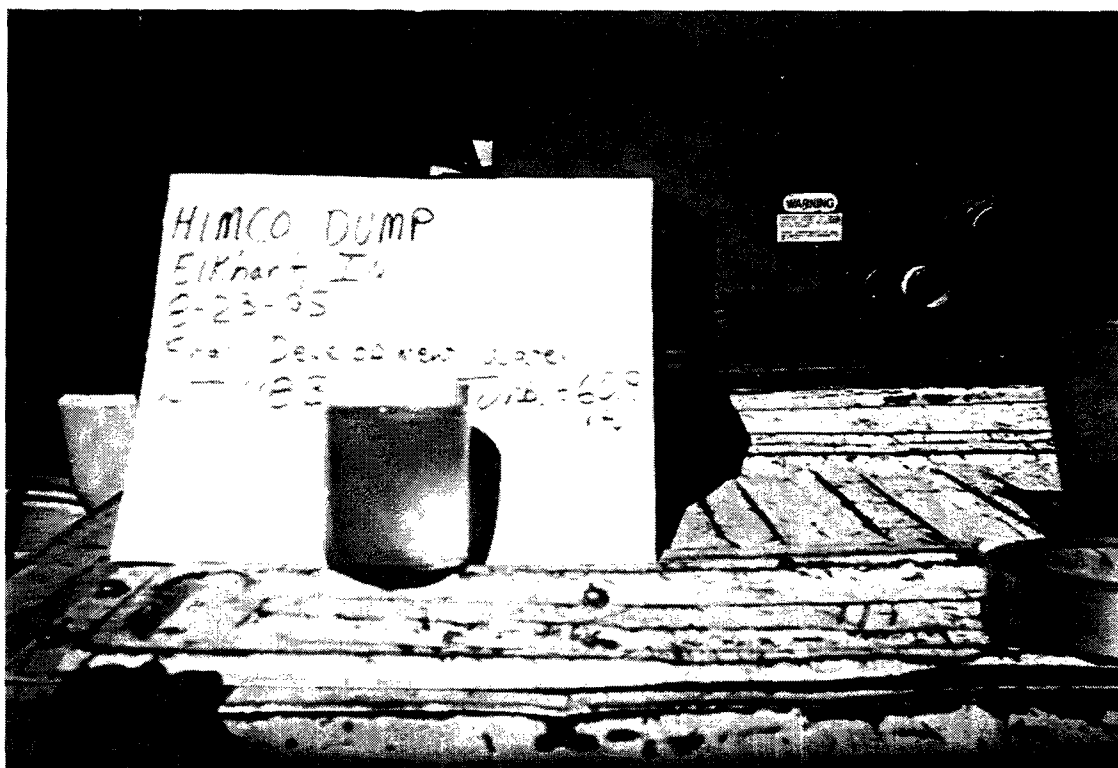


Exposure No. 48: Monitoring well WT117A final development water sample.



Exposure No. 49: Monitoring well WT117B final development water sample.

PHOTO LOG



Exposure No. 50: Monitoring well WT118B final development water sample.

APPENDIX B:
MONITORING WELL BORING LOGS

TABLE OF CONTENTS

Boring/Well No.

WT112A
WT112B
WT113A
WT113B

Boring/Well No.

WT114A
WT114B
WT115A
WT116A

Boring/Well No.

WT116B
WT117A
WT117B
WT118B

HTW DRILLING LOG

HOLE NO.
WT112A

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 3 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING
AND SAMPLING EQUIPMENT

4 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P1101PID; ISTMX
410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-23-95

11. DATE COMPLETED
8-23-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
9.5'

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-24-95 9:56 AM 8.5'

14. TOTAL DEPTH OF HOLE
16.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED
1

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

2" PVC

23. SIGNATURE OF INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0		BACKGROUND HNU = 2.8 UNITS O ₂ = 20.9% LEL = 0%				
	1						
	2						
	3						
	4	POORLY GRADED SAND (SP): MEDIUM DENSE, MOIST, TAN. MEDIUM TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 3.3 UNITS O ₂ = 20.8% LEL = 0%			4	N = 12 REC. = 1.5'
						5	
						7	
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT112A

HTW DRILLING LOG

HOLE NO.
WTII2A

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 2
OF 3 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9	WELL GRADED GRAVEL WITH SAND (GW): MEDIUM DENSE, MOIST, TAN, 20% MEDIUM TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 3.0 UNITS O ₂ = 20.9% LEL = 0%			4	N = 16 REC. = 1.4'
						7	10:07 AM WATER @ 9.5'
						9	
	10						
	11						
	12						
	13						
	14	WELL GRADED SAND WITH GRAVEL (SW): WET, BROWN, 15%-20% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 3.0 UNITS O ₂ = 20.9% LEL = 0%	D-1		13	N = 127 REC. = 1.5'
						67	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII2A

HTW DRILLING LOG

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

HOLE NO.
WTII2A

SHEET 3
OF 3 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15		D-1			60	SPLIT SPOON SAMPLER WAS FULL, POSSIBLY CAUSING ARTIFICIALLY HIGH BLOW COUNTS.
	16	BOTTOM OF HOLE @ 16.0'					
	17						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII2A

HTW DRILLING LOG

HOLE NO.
WTII2B

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 7 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING
AND SAMPLING EQUIPMENT

6 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P1101PID; ISTMX
410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-23-95

11. DATE COMPLETED
8-23-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
SEE LOG OF WTII2A

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-24-95 9:58AM 8.8'

14. TOTAL DEPTH OF HOLE
59.3'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	SEE LOG OF BORING FOR WTII2A FOR A DESCRIPTION OF MATERIALS DOWN TO 15' BELOW GROUND SURFACE.	BACKGROUND HNU = 2.8 UNITS O2 = 20.9% LEL = 0%				AUGERED TO 18.5' AND OBTAINED FIRST SAMPLE FROM 18.5'-20.0' AND EVERY 5' THEREAFTER
	1						
	2						
	3						
	4						
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII2B

HTW DRILLING LOG

HOLE NO.
WTII2B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 2
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII2B

HTW DRILLING LOG

HOLE NO.
WT112B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 3
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15						
	16						
	17						
	18						
	19	WELL GRADED GRAVEL (GW); WET, BROWN TO LIGHT BROWN, FINE TO COARSE GRAVEL, OUTWASH DEPOSITS. POORLY GRADED SAND (SP); WET, TAN, FINE TO MEDIUM SAND WITH APPROXIMATELY 10% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 3.4 UNITS O ₂ = 20.9% LEL = 0%			4	N = 27 REC. = 1.5'
	20	WELL GRADED GRAVEL (GW); SAME AS THE INTERVAL FROM 18.5'-18.9'.				10	
	21					17	
	22						
	23						
	24	WELL GRADED GRAVEL (GW); SAME AS THE INTERVAL FROM 18.5'-18.9' EXCEPT MEDIUM DENSE GRAVEL UP TO 1/2" IN DIAMETER.				6	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT112B

HTW DRILLING LOG

HOLE NO.

WT112B

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

SHEET 4

OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
		POORLY GRADED SAND WITH GRAVEL (SP): MEDIUM DENSE, WET, MEDIUM GRAINED SAND, 20%-25% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 3.2 UNITS O ₂ = 20.9% LEL = 0%			9	N = 19 REC. = 0.8'
	25					10	
	26						
	27						
	28						
	29	POORLY GRADED SAND WITH GRAVEL (SP): SAME AS THE INTERVAL FROM 23.9'-25.0' EXCEPT DENSE, 20% GRAVEL.	BREATHING ZONE HNU = 3.2 UNITS O ₂ = 20.9% LEL = 0%			5	N = 36 REC. = 1.5'
						12	
	30					24	
	31						
	32						
	33						

PROJECT

HIMCO DUMP SUPERFUND SITE

HOLE NO.

WT112B

HTW DRILLING LOG

HOLE NO.
WTII2B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 5
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	34	POORLY GRADED SAND WITH GRAVEL (SP): SAME AS THE INTERVAL FROM 23.9'-25.0'.	BREATHING ZONE HNU = 3.0 UNITS O ₂ = 20.9% LEL = 0%			6	N = 26 REC. = 1.2'
						12	
						14	
	35						
	36						
	37						
	38						
	39	POORLY GRADED SAND WITH GRAVEL (SP): SAME AS THE INTERVAL FROM 23.9'-25.0' EXCEPT BROWN, 35%-40% GRAVEL UP TO 1 1/2" IN DIAMETER.	BREATHING ZONE HNU = 3.4 UNITS O ₂ = 20.9% LEL = 0%			35	N = 29 REC. = 0.4'
						16	
						13	
	40						
	41						
	42						
	43						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII2B

HTW DRILLING LOG

HOLE NO.
WT112B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 6
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	44	POORLY GRADED SAND WITH GRAVEL (SP): SAME AS THE INTERVAL FROM 23.9'-25.0' EXCEPT GRAVEL UP TO 1 1/2" IN DIAMETER.	BREATHING ZONE HNU = 3.4 UNITS O ₂ = 20.9% LEL = 0%			21	N = 23 REC. = 1.2'
						16	
	45					7	
	46						
	47						
	48						
	49						
		POORLY GRADED SAND (SP): VERY DENSE, WET, BROWN, FINE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 3.0 UNITS O ₂ = 20.9% LEL = 0%			15	N = 52 REC. = 1.2'
						16	
	50					36	
	51						
	52						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT112B

HTW DRILLING LOG

HOLE NO.
WTII2B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 7
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
53		POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 49.2'-50.0'. POORLY GRADED SAND WITH GRAVEL (SP): VERY DENSE, WET, 25%-30% GRAVEL UP TO 1 1/2" IN DIAMETER, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 3.2 UNITS O ₂ = 20.9% LEL = 0%				N = 62 REC. = 1.5'
54						13	
55						23	
56						39	
57							
58							
59		POORLY GRADED SAND (SP): VERY DENSE, WET, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 2.8 UNITS O ₂ = 20.9% LEL = 0%	D-1		11	N = 89 (ONE 6" INTERVAL ONLY) REC. = 0.8'
		BOTTOM OF HOLE @ 59.3'				89	
60							CLEANED HOLE OUT WITH AUGERS TO 60.0', THEN SET MONITORING WELL IN BORING.

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII2B

HTW DRILLING LOG

HOLE NO.
WT113A

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 1 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING
AND SAMPLING EQUIPMENT

4 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P1101PID; ISTMX
410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-10-95

11. DATE COMPLETED
8-10-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
16.5'

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-11-95 2:30 PM 15.75'

14. TOTAL DEPTH OF HOLE
23.7'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

2" PVC

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	SEE LOG OF BORING FOR WT113B FOR A DESCRIPTION OF MATERIALS.	BACKGROUND HNU = 1.0 UNITS O ₂ = 20.9% LEL = 0%				AUGERED TO 23.7' AND SET A MONITORING WELL IN THE BORING.
	5		BREATHING ZONE HNU = 0.0 UNITS O ₂ = 20.9% LEL = 0%				
	10						
	15						
	20		BREATHING ZONE HNU = 2.0 UNITS O ₂ = 21.0% LEL = 0%				
		BOTTOM OF HOLE @ 23.7'					
	25						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT113A

HTW DRILLING LOG

HOLE NO.
WTII3B

SHEET 1

OF 8 SHEETS

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH II00C

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT
6 1/4" I.D. HSA; 6" O.D. CME CONTINUOUS SAMPLER TO 23.5', THEN SWITCHED TO 2" O.D. CARBON STEEL SPLIT SPOON SAMPLER DRIVEN BY A 140 POUND HAMMER FOR SPT; HNU PII01PID; ISTMX 410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-9-95

11. DATE COMPLETED
8-10-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
16.8'

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-10-95 8:03 AM 16.3', 8-11-95 2:15 PM 16.0'

14. TOTAL DEPTH OF HOLE
70.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

2" PVC

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	TOPSOIL: BROWN, ROOTS.	BACKGROUND HNU = 0.2 UNITS O ₂ = 20.9% LEL = 0%				RUN #1 START 9:44 STOP 9:48 REC. = 5.0'
	1	POORLY GRADED SAND (SP): MOIST, LIGHT BROWN, FINE TO MEDIUM SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.0 UNITS O ₂ = 20.9% LEL = 0%				
	2						
	3						
	4						
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII3B

HTW DRILLING LOG

HOLE NO.
WTII3B

SHEET 2

OF 8 SHEETS

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 0.5'-5.0' EXCEPT FINE TO COARSE SAND AND UP TO 10% GRAVEL.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 21.0% LEL = 0%				RUN #2 START 9:52 STOP 9:56 REC. = 3.7'
	7						
	8						
	9						
	10						
	11		BREATHING ZONE HNU = 0.9 UNITS O ₂ = 20.9% LEL = 0%				RUN #3 START 10:01 STOP 10:05
	12						
	13	WELL GRADED GRAVEL WITH SAND (GW): LIGHT BROWN, 65%-70% FINE TO COARSE GRAVEL, 30%-35% FINE TO COARSE SAND, OUTWASH DEPOSITS.					
	14						MEASURED HOLE @ 14' BELOW GROUND SURFACE AT THE END OF RUN #3.

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII3B

HTW DRILLING LOG

HOLE NO.
WT113B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 3
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEO TECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15	WELL GRADED GRAVEL WITH SAND (GW): SAME AS THE INTERVAL FROM 10.0'-15.0'.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 20.9% LEL = 0%				RUN #4 START 10:12 STOP 10:16
	16						
	17						
	18		BREATHING ZONE HNU = 0.7 UNITS O ₂ = 21.0% LEL = 0%				MEASURED HOLE @ 17.5' BELOW GROUND SURFACE AT THE END OF RUNWAY.
	19						
	20						
	21		BREATHING ZONE HNU = 0.4 UNITS O ₂ = 20.9% LEL = 0%				RUN #5
	22						
	23						
	24	WELL GRADED GRAVEL WITH SAND (GW): SAME AS THE INTERVAL FROM 10.0'-15.0'.				40	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT113B

HTW DRILLING LOG

HOLE NO.
WTII3B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 4
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
						36	N = 139 REC. = 1.5'
						103	AUTOMATIC HAMMER APPARENTLY MELFUNCTIONED, PRODUCING ARTIFICIALLY HIGH BLOW COUNTS.
25							
	26						
	27						
	28						
	29	POORLY GRADED SAND WITH GRAVEL (SP): MEDIUM DENSE, WET, BROWN, 15% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.7 UNITS O ₂ = 21.0% LEL = 0%			5	N = 18 REC. = 1.3'
						7	
						11	
	30						
	31						
	32						
	33						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII3B

HTW DRILLING LOG

HOLE NO.
WT113B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 5
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	34	POORLY GRADED SAND WITH GRAVEL (SP); SAME AS THE INTERVAL FROM 28.5'-30.0' EXCEPT LOOSE.	BREATHING ZONE HNU = 1.4 UNITS O ₂ = 20.9% LEL = 0%			1	N = 4 REC. = 0.5'
						1	
	35					3	
	36						
	37						
	38						
	39	WELL GRADED SAND (SW); LOOSE, WET, DARK TO LIGHT BROWN, 5% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.4 UNITS O ₂ = 20.9% LEL = 0%			1	N = 5 REC. = 1.4'
						1	
	40					4	
	41						
	42						
	43						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT113B

HTW DRILLING LOG

HOLE NO.
WT113B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 6
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	44	WELL GRADED GRAVEL WITH SAND (GW): VERY DENSE, BROWN TO LIGHT BROWN, 80% FINE TO COARSE GRAVEL, 20% FINE TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.4 UNITS O ₂ = 20.9% LEL = 0%			9	N = 70 REC. = 1.5'
						20	
	45					50	
	46	WELL GRADED GRAVEL WITH SAND (GW): SAME AS THE INTERVAL FROM 44.2'-45.0' EXCEPT MEDIUM DENSE.	BREATHING ZONE HNU = 1.1 UNITS O ₂ = 20.9% LEL = 0%				MEASURED HOLE Ø 45.6' B.O.H.
	47						
	48						
	49					2	
						18	
	50					7	
	51						
	52						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT113B

HTW DRILLING LOG

HOLE NO.
WT113B

SHEET 7

OF 8 SHEETS

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
53		WELL GRADED SAND (SW): SATURATED, DENSE, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.8 UNITS O ₂ = 20.9% LEL = 0%				N = 49 REC. = 0.8'
54						13	
55						28	
56		POORLY GRADED SAND (SP): MEDIUM DENSE, WET, GREY TO BROWN, 5% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.4 UNITS O ₂ = 20.9% LEL = 0%			21	N = 12 REC. = 1.5'
57							
58							
59						1	
60						2	
61						10	
62							

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT113B

HTW DRILLING LOG

HOLE NO.
WT113B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 8
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
63							
64		POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 58.5'-60.0' EXCEPT LOOSE.	BREATHING ZONE HNU = 0.4 UNITS O ₂ = 20.9% LEL = 0%	D-1		2	N = 7 REC. = 1.5'
65						2	
66						5	
67							
68							
69			BREATHING ZONE HNU = 2.1 UNITS O ₂ = 20.9% LEL = 0%			2	N = 5 REC. = 0
70						3	
71						2	
		BOTTOM OF HOLE @ 70.0'					BOTTOM OF HOLE MEASURED AT 67.8' BELOW GROUND SURFACE UPON PULLING THE SPLIT SPOON SAMPLER.

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT113B

HTW DRILLING LOG

HOLE NO.
WT114A

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 3 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT
4 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P110IPID; ISTMX
410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-21-95

11. DATE COMPLETED
8-21-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
16.0'

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-22-95 7:47 AM 15.1'

14. TOTAL DEPTH OF HOLE
23.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED
1

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

2" PVC

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0		BACKGROUND HNU = 0.6 UNITS O ₂ = 20.9% LEL = 0%				
	1						
	2						
	3						
	4	POORLY GRADED SAND (SP); LOOSE MOIST, TAN, MEDIUM TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 20.9% LEL = 0%			3	N = 6 REC. = 1.3'
						3	
						3	
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT114A

HTW DRILLING LOG

HOLE NO.
WTII4A

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 2
OF 3 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9	POORLY GRADED SAND (SP); SAME AS THE INTERVAL FROM 3.5'-5.0' EXCEPT RUST COLOR, COARSER SAND.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 20.9% LEL = 0%			3	N = 9 REC. = 1.4'
						4	
						5	
	10						
	11						
	12						
	13						
	14	POORLY GRADED SAND (SP); SAME AS THE INTERVAL FROM 3.5'-5.0' EXCEPT LIGHT BROWN, COARSER SAND.	BREATHING ZONE HNU = 0.1 UNITS O ₂ = 21.0% LEL = 0%			3	N = 7 REC. = 1.5'
						3	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII4A

HTW DRILLING LOG

HOLE NO.

WT114A

SHEET 3

OF 3 SHEETS

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15					4	
▽	16						WATER @ 16.0'
	17						
	18						
	19	POORLY GRADED SAND (SP); SAME AS THE INTERVAL FROM 3.5'-5.0' EXCEPT MEDIUM DENSE, WET, BROWN. 10% GRAVEL.		D-1		4	N = 25 REC. = 1.5'
	20					8	
	21					17	
	22						
	23						
	24						
		BOTTOM OF HOLE @ 23.0'					

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT114A

HTW DRILLING LOG

HOLE NO.
WT114B

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 8 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING
AND SAMPLING EQUIPMENT
6 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P1101PID;
ISTMX 410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-22-95

11. DATE COMPLETED
8-22-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
SEE LOG OF WT114A

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-23-95 9:00AM 15.2'

14. TOTAL DEPTH OF HOLE
66.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED
1

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

2" PVC

23. SIGNATURE OF INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	SEE LOG OF BORING FOR WT114A FOR A DESCRIPTION OF MATERIALS DOWN TO 20.0' BELOW GROUND SURFACE.	BACKGROUND HNU = 0.8 UNITS O ₂ = 20.9% LEL = 0%				AUGERED TO 23.5' AND OBTAINED FIRST SAMPLE FROM 23.5'-25.0' AND EVERY 5' THEREAFTER.
	1						
	2						
	3						
	4						
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT114B

HTW DRILLING LOG

HOLE NO.
WT114B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 2
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT114B

HTW DRILLING LOG

HOLE NO.
WTII4B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 3
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24	POORLY GRADED SAND (SP): MEDIUM DENSE, WET, BROWN, TRACE OF GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 4.0 UNITS O ₂ = 20.9% LEL = 0%			1	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII4B

HTW DRILLING LOG

HOLE NO.
WT114B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 4
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	25					6	N = 21 REC. = 1.5'
						15	
	26						
	27						
	28						
	29	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 23.5'-25.0'.	BREATHING ZONE HNU = 5.2 UNITS O ₂ = 20.8% LEL = 0%			2	N = 13 REC. = 1.2'
		WELL GRADED SAND (SW): MEDIUM DENSE, WET, BROWN, MEDIUM TO COARSE SAND, 10%-15% FINE GRAVEL, OUTWASH DEPOSITS.				4	
	30					9	
	31						
	32						
	33						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT114B

HTW DRILLING LOG

HOLE NO.
WTII4B

SHEET 5

OF 8 SHEETS

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	34	POORLY GRADED SAND WITH GRAVEL (SP): DENSE, WET, MEDIUM TO COARSE SAND, 20%-25% FINE TO COARSE GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 5.2 UNITS O ₂ = 20.7% LEL = 0%			24	N = 31 REC. = 1.0'
						17	
						14	
	35						
	36						
	37						
	38						
	39	POORLY GRADED SAND WITH GRAVEL (SP): SAME AS THE INTERVAL FROM 33.5'-35.0' EXCEPT MEDIUM DENSE.	BREATHING ZONE HNU = 5.0 UNITS O ₂ = 20.8% LEL = 0%			3	N = 11 REC. = 0.4'
						3	
						8	
	40						
	41						
	42						
	43						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII4B

HTW DRILLING LOG

HOLE NO.
WT114B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 6
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	44	POORLY GRADED SAND WITH GRAVEL (SP): SAME AS THE INTERVAL FROM 33.5'-35.0' EXCEPT MEDIUM DENSE, 35% GRAVEL.	BREATHING ZONE HNU = 4.8 UNITS O ₂ = 20.7% LEL = 0%			13	N = 27 REC. = 0.2'
	45					14	
	46					13	
	47						
	48						
	49	POORLY GRADED SAND (SP): MEDIUM DENSE, WET, BROWN, MEDIUM TO COARSE SAND, TRACE OF GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 5.0 UNITS O ₂ = 20.7% LEL = 0%			23	N = 26 REC. = 0.7'
	50					20	
	51					6	
	52						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT114B

HTW DRILLING LOG

HOLE NO.
WTII4B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 7
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	53	WELL GRADED SAND WITH GRAVEL (SW): MEDIUM DENSE, WET. BROWN, GRAVEL UP TO 3/4" IN DIAMETER.	BREATHING ZONE HNU = 3.8 UNITS O ₂ = 20.8% LEL = 0%				N = 21 REC. = 0.1'
	54					10	
	55					12	
	56					9	
	57	WELL GRADED SAND WITH GRAVEL (SW): SAME AS THE INTERVAL FROM 53.5'-55.0'.	BREATHING ZONE HNU = 3.8 UNITS O ₂ = 20.8% LEL = 0%				N = 18 REC. = 0.5'
	58						
	59					15	
	60					9	
	61					9	
	62						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII4B

HTW DRILLING LOG

HOLE NO.
WTII4B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 8
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	63	WELL GRADED GRAVEL WITH SAND (GW): MEDIUM DENSE, WET, BROWN TO GREY, 15%-20% MEDIUM TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 4.8 UNITS O2 = 20.8% LEL = 0%				N = 19 REC. = 1.5'
	64			D-1		5	
						7	
	65					12	
	66	BOTTOM OF HOLE @ 66.0'					
	67						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII4B

HTW DRILLING LOG

HOLE NO.
WT115A

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 3 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING
AND SAMPLING EQUIPMENT

4 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P1101PID; ISTMX
410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-22-95

11. DATE COMPLETED
8-22-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
12.2'

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED

14. TOTAL DEPTH OF HOLE
18.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

2" PVC

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0		BACKGROUND HNU = 1.0 UNITS O ₂ = 20.9% LEL = 0%				
	1						
	2						
	3						
	4	POORLY GRADED SAND (SP); LOOSE, MOIST, TAN, MEDIUM TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.5 UNITS O ₂ = 20.9% LEL = 0%			2	N = 9 REC. = 1.5'
						4	
						5	
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT115A

HTW DRILLING LOG

HOLE NO.
WT115A

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 2
OF 3 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 3.5'-5.0' EXCEPT A LITTLE FINER GRAINED.	BREATHING ZONE HNU = 0.8 UNITS O ₂ = 20.9% LEL = 0%			1	N = 3 REC. = 0.4'
						1	
	10					2	
	11						
	12						WATER @ 12.2'
	13						
	14	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 3.5'-5.0' EXCEPT MEDIUM DENSE.	BREATHING ZONE HNU = 0.6 UNITS O ₂ = 21.0% LEL = 0%	D-1		3	N = 10 REC. = 1.5'
						5	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT115A

OF 3 SHEETS

HIMCO DUMP SUPERFUND SITE

MICHELLE BENAK

HOLE NO.
WT115A

HTW DRILLING LOG

HOLE NO.
WT116A

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 3 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING
AND SAMPLING EQUIPMENT

4 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P110IPID; ISTMX
410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-17-95

11. DATE COMPLETED
8-17-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
10.6'

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-18-95 7:40 AM 7.9'

14. TOTAL DEPTH OF HOLE
15.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	SEE LOG OF BORING FOR WT116B FOR A DESCRIPTION OF MATERIALS DOWN TO 10' BELOW GROUND SURFACE.	BACKGROUND HNU = 0.2 UNITS O2 = 20.9% LEL = 0%				AUGERED TO 13.5' AND OBTAINED A SAMPLE FROM 13.5'- 15.0'.
	1						
	2						
	3						
	4						
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT116A

HTW DRILLING LOG

HOLE NO.
WT116A

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 2
OF 3 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9						
	10						
▽							WATER @ 10.6'
	11						
	12						
	13						
	14	POORLY GRADED SAND (SP): LOOSE, WET, GREY, 5% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE O ₂ = 20.9% LEL = 0%			1 1	N = 4 REC. = 1.5'

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT116A

HTW DRILLING LOG

HOLE NO.	
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WT116A

SHEET 3

OF 3 SHEETS

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15	BOTTOM OF HOLE @ 15.0'				3	

PROJECT

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.

HOLE NO.
WT#6A

HTW DRILLING LOG

HOLE NO.
WT116B

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 7 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT
6 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P1101PID;
ISTMX 410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-16-95

11. DATE COMPLETED
8-17-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
2.4' (CEMENT MAY HAVE TRAPPED WATER)

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-16-95 12:40 PM 9.5' 8-17-95 7:35 AM 7.6'

14. TOTAL DEPTH OF HOLE
60.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)
8-18-95 9:00 AM 10.9'

18. GEOTECHNICAL SAMPLES

DISTURBED
1

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

2" PVC

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	TOPSOIL - VEGETATED, WEEDS.	BACKGROUND HNU = 2.6 UNITS O ₂ = 20.8% LEL = 0%				
	1						
	2						
	3						
	4	CONSTRUCTION RUBBLE: RECOVERED PIECES OF CONCRETE, COVERED BY BLACK SUBSTANCE.	BREATHING ZONE HNU = 3.2 UNITS O ₂ = 20.8% LEL = 0%			65 8 65	WATER @ 2.4' N = 73 REC. = 1.4'
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT116B

HTW DRILLING LOG

HOLE NO.

WT116B

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

SHEET 2

OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9	POORLY GRADED SAND (SP): LOOSE, MOIST, GREY, FINE TO MEDIUM SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.4 UNITS O ₂ = 20.8% LEL = 0%			1	N = 6 REC. = 1.4'
		ORGANIC SOIL (OL/OH): MEDIUM STIFF, MOIST, BLACK, SOME ROOTS.				3	
						3	
	10						
	11						
	12						
	13						
	14	POORLY GRADED SAND (SP): LOOSE, WET, GREY, MEDIUM SAND, 5% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.0 UNITS O ₂ = 20.9% LEL = 0%			1	N = 3 REC. = 1.5'
						2	

PROJECT

HIMCO DUMP SUPERFUND SITE

HOLE NO.

WT116B

HTW DRILLING LOG

HOLE NO.

WT116B

SHEET 3

OF 7 SHEETS

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15					1	
	16						
	17						
	18						
	19	NO RECOVERY	BREATHING ZONE HNU = 1.2 UNITS O ₂ = 20.9% LEL = 0%			1	N = 2 REC. = 0.0'
	20					1	
	21					1	
	22						
	23						
	24	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 13.5'-15.0' EXCEPT MEDIUM DENSE, MEDIUM TO COARSE SAND, 10% GRAVEL.	BREATHING ZONE HNU = 1.2 UNITS O ₂ = 20.9% LEL = 0%			4	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT116B

HTW DRILLING LOG

HOLE NO.
WT116B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 4
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	25					8	N = 20 REC. = 1.5'
						12	
	26						
	27						
	28						
	29	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 13.5'-15.0' EXCEPT MEDIUM DENSE, MEDIUM TO COARSE SAND.	BREATHING ZONE HNU = 1.4 UNITS O ₂ = 20.9% LEL = 0%			9	N = 10 REC. = 1.4'
						7	
						3	
	30						
	31						
	32						
	33						
							END OF DRILLING 8-16-95

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT116B

HTW DRILLING LOG

HOLE NO.
WT116B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 5
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	34	POORLY GRADED SAND (SP); SAME AS THE INTERVAL FROM 13.5'-15.0'.	BREATHING ZONE HNU = 1.6 UNITS O ₂ = 20.8% LEL = 0%			1	BEGIN DRILLING ON 8-17-95 N = 5 REC. = 1.5'
						2	
						3	
	35						
	36						
	37						
	38						
	39	POORLY GRADED SAND (SP); SAME AS THE INTERVAL FROM 13.5'-15.0'.	BREATHING ZONE HNU = 0.8 UNITS O ₂ = 20.8% LEL = 0%			1	N = 6 REC. = 1.5'
						3	
						3	
	40						
	41						
	42						
	43						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT116B

HTW DRILLING LOG

HOLE NO.
WT116B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 6
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	44	POORLY GRADED SAND (SP); SAME AS THE INTERVAL FROM 13.5'-15.0' EXCEPT MEDIUM DENSE.	BREATHING ZONE HNU = 2.2 UNITS O ₂ = 20.8% LEL = 0%			8	N = 15 REC. = 1.5'
	45					10	
	46					5	
	47						
	48						
	49	POORLY GRADED SAND (SP); SAME AS THE INTERVAL FROM 13.5'-15.0'.	BREATHING ZONE HNU = 0.8 UNITS O ₂ = 20.8% LEL = 0%			5	N = 9 REC. = 1.5'
	50					5	
	51					4	
	52						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT116B

HTW DRILLING LOG

HOLE NO.
WTII6B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 7
OF 7 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
53							
54		POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 13.5'-15.0' EXCEPT MEDIUM TO COARSE SAND.	BREATHING ZONE HNU = 2.0 UNITS O ₂ = 20.8% LEL = 0%			2	N = 7 REC. = 1.5'
		POORLY GRADED SAND (SP): LOOSE, WET, BROWN, FINE SAND, OUTWASH DEPOSITS.				2	
55						5	
56							
57							
58							
59		POORLY GRADED SAND (SP): LOOSE, WET, GREY, 10% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.0 UNITS O ₂ = 20.9% LEL = 0%	D-1		3	N = 6 REC. = 1.5'
						3	
						3	
60		BOTTOM OF HOLE @ 60.0'					
61							
62							

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII6B

HTW DRILLING LOG

HOLE NO.
WTH7A

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 3 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING
AND SAMPLING EQUIPMENT

4 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P1101PID; ISTMX
410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-15-95

11. DATE COMPLETED
8-15-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
SEE LOG OF WTH7B

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-18-95 11:00AM 11.3'

14. TOTAL DEPTH OF HOLE
17.5'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED
1

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

23. SIGNATURE OF INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	SEE LOG OF BORING FOR WTH7B FOR A DESCRIPTION OF MATERIALS DOWN TO 10' BELOW GROUND SURFACE.	BACKGROUND HNU = 1.2 UNITS O2 = 20.9% LEL = 0%				AUGERED TO 13.5' AND OBTAINED A SAMPLE FROM 13.5' - 15.0'.
	1						
	2		BREATHING ZONE HNU = 1.2 UNITS O2 = 20.8% LEL = 0%				
	3						
	4						
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTH7A

HTW DRILLING LOG

HOLE NO.
WTII7A

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 2
OF 3 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14	WELL GRADED SAND (SW): MEDIUM DENSE, WET, BROWN, FINE TO MEDIUM SAND, OUTWASH DEPOSITS.				4	N = 10 REC. = 1.2'
						6	WATER ADDED TO HOLE TO RETRIEVE SAMPLE.

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII7A

HTW DRILLING LOG

HOLE NO.

WT117A

SHEET 3

OF 3 SHEETS

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15					4	
	16						
	17						
	18	BOTTOM OF HOLE @ 17.5'					

PROJECT

HIMCO DUMP SUPERFUND SITE

HOLE NO.

WT117A

HTW DRILLING LOG

HOLE NO.
WTII7B

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 8 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT
6 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU P1101PID;
ISTMX 410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-14-95

11. DATE COMPLETED
8-14-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
11.5'

13. DEPTH DRILLED INTO ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-15-95 7:51AM 11.0' 8-18-95 11:54AM 10.3'

14. TOTAL DEPTH OF HOLE
65.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED
1

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

2" PVC

23. SIGNATURE OF INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0		BACKGROUND HNU = 3.2 UNITS O ₂ = 20.9% LEL = 0%				
	1						
	2						
	3						
	4	POORLY GRADED SAND (SP); LOOSE. MOIST, LIGHT BROWN, FINE TO COARSE SAND, OUTWASH DEPOSITS.				2	N = 6 REC. = 1.5'
						3	
	5					3	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WTII7B

HTW DRILLING LOG

HOLE NO.
WT117B

SHEET 2

OF 8 SHEETS

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9	WELL GRADED SAND (SW): LOOSE, MOIST, LIGHT BROWN, MEDIUM TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 3.0 UNITS O ₂ = 20.9% LEL = 0%			3	N = 8 REC. = 1.4'
						4	
						4	
	10						
	11						
							WATER MEASURED @ 11.5'
	12						
	13						
	14	WELL GRADED SAND (SW): SAME AS THE INTERVAL FROM 8.5'-10.0' EXCEPT MEDIUM DENSE, WET, COARSER GRAINED, 5% GRAVEL.	BREATHING ZONE HNU = 2.5 UNITS O ₂ = 20.9% LEL = 0%			1	N = 12 REC. = 1.5'
						4	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT117B

HTW DRILLING LOG

HOLE NO.

WT117B

SHEET 3

OF 8 SHEETS

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15					8	
	16						
	17						
	18						
	19	WELL GRADED SAND (SW): SAME AS THE INTERVAL FROM 8.5'-10.0' EXCEPT WET.	BREATHING ZONE HNU = 2.0 UNITS O ₂ = 20.9% LEL = 0%			3	N = 14 REC. = 1.5'
	20	POORLY GRADED SAND (SP): MEDIUM DENSE, WET, LIGHT GREY, FINE TO MEDIUM SAND, OUTWASH DEPOSITS.				6	
	21					8	
	22						
	23						
	24	WELL GRADED SAND WITH GRAVEL (SW): LOOSE, WET, GREY, FINE TO COARSE SAND, 15%-20% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 2.0 UNITS O ₂ = 20.9% LEL = 0%			2	

PROJECT

HIMCO DUMP SUPERFUND SITE

HOLE NO.

WT117B

HTW DRILLING LOG

HOLE NO.
WT117B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 4
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	25					2	N = 8 REC. = 0.8'
						6	
	26						
	27						
	28						
	29	WELL GRADED SAND WITH GRAVEL (SW): SAME AS THE INTERVAL FROM 23.5'-25.0'.	BREATHING ZONE HNU = 1.8 UNITS O ₂ = 20.9% LEL = 0%			3	N = 18 REC. = 1.4'
		WELL GRADED GRAVEL (GW): WET, GREY, COARSE GRAVEL, OUTWASH DEPOSITS.				4	
	30	WELL GRADED SAND WITH GRAVEL (SW): SAME AS THE INTERVAL FROM 23.5'-25.0'.				14	
	31						
	32						
	33						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT117B

HTW DRILLING LOG

HOLE NO.
WT117B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 5
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	34	WELL GRADED SAND (SW); MEDIUM DENSE, WET, GREY, FINE TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.6 UNITS O ₂ = 20.9% LEL = 0%			3	N = 14 REC. = 1.5'
						6	
						8	
	35						
	36						
	37						
	38						
	39	WELL GRADED SAND (SW); SAME AS THE INTERVAL FROM 33.5'-35.0' EXCEPT DENSE, 5% GRAVEL.	BREATHING ZONE HNU = 1.8 UNITS O ₂ = 20.9% LEL = 0%			4	N = 37 REC. = 1.5'
						10	
						27	
	40						
	41						
	42						
	43						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT117B

HTW DRILLING LOG

HOLE NO.

WT117B

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

SHEET 6

OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	44	WELL GRADED GRAVEL (GW): LOOSE, WET, GREY, FINE TO COARSE GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.6 UNITS O ₂ = 20.9% LEL = 0%			5	N = 8 REC. = 1.2'
	45					4	
	46					4	
	47						
	48						
	49	WELL GRADED GRAVEL (GW): SAME AS THE INTERVAL FROM 43.5'-45.0' EXCEPT MEDIUM DENSE.	BREATHING ZONE HNU = 1.5 UNITS O ₂ = 20.9% LEL = 0%			10	N = 12 REC. = 1.1'
	50					5	
	51					7	
	52						

PROJECT

HIMCO DUMP SUPERFUND SITE

HOLE NO.

WT117B

HTW DRILLING LOG

HOLE NO.
WT117B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 7
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
53		POORLY GRADED SAND WITH GRAVEL (SP): DENSE, WET, GREY, FINE TO COARSE SAND, 15%-20% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.6 UNITS O ₂ = 20.9% LEL = 0%				N = 34 REC. = 0.6'
54						19	
55						22	
56		WELL GRADED GRAVEL (GW): LOOSE, WET, GREY, FINE TO COARSE GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 1.6 UNITS O ₂ = 20.9% LEL = 0%			12	N = 7 REC. = 0.9'
57							
58							
59						4	
60						4	
61						3	
62							

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT117B

HTW DRILLING LOG

HOLE NO.
WT117B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 8
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	63	WELL GRADED GRAVEL (GW): SAME AS THE INTERVAL FROM 58.5'-60.0'.	BREATHING ZONE HNU = 0.5 UNITS O ₂ = 20.9% LEL = 0%				N = 7 REC. = 1.5'
	64					1	
						4	
	65	BOTTOM OF HOLE @ 65.0'				3	THE MONITORING WELL SET IN THIS BORING WAS ABANDONED DUE TO NON-COMPLIANCE WITH THE FIELD SAMPLING PLAN. A NEW BORING LOCATED 10.0' SOUTH OF THE ORIGINAL BORING WAS AUGERED DOWN TO 62.5' BELOW GROUND SURFACE AND A NEW MONITORING WELL WAS INSTALLED.
	66						
	67						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT117B

HTW DRILLING LOG

HOLE NO.
WT118B

1. COMPANY NAME
U.S. ARMY CORPS OF ENGINEERS

2. DRILLING SUBCONTRACTOR
N/A

SHEET 1
OF 8 SHEETS

3. PROJECT
HIMCO DUMP SUPERFUND SITE

4. LOCATION
ELKHART, IN.

5. NAME OF DRILLER
JOE MORRISSEY

6. MANUFACTURER'S DESIGNATION OF DRILL
GUS PECH 1100C

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT
6 1/4" I.D. HSA; 2" O.D. CARBON
STEEL SPLIT SPOON SAMPLER
DRIVEN BY A 140 POUND HAMMER
FOR SPT; HNU PHOIPID;
ISTMX 410 CGI.

8. HOLE LOCATION

9. SURFACE ELEVATION

10. DATE STARTED
8-18-95

11. DATE COMPLETED
8-18-95

12. OVERBURDEN THICKNESS
UNKNOWN

15. DEPTH GROUNDWATER ENCOUNTERED
12.0'

13. DEPTH DRILL TO BED ROCK
N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
8-21-95 9:24AM 11.0'

14. TOTAL DEPTH OF HOLE
63.5'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED
1

UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC

METALS

OTHER (SPECIFY)

OTHER (SPECIFY)

OTHER (SPECIFY)

21. TOTAL CORE
RECOVERY
%

22. DISPOSITION OF HOLE

BACKFILLED

MONITORING WELL

OTHER (SPECIFY)

2" PVC

23. SIGNATURE OF INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	TOPSOIL - WEEDS	BACKGROUND HNU = 0.2 UNITS O ₂ = 20.8% LEL = 0%				
	1						
	2						
	3						
	4	POORLY GRADED SAND WITH SILT (SP-SM); MOIST, BROWN, OUTWASH DEPOSITS. POORLY GRADED SAND (SP); LOOSE, MOIST, LIGHT BROWN, MEDIUM TO COARSE SAND, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.0 UNITS O ₂ = 20.9% LEL = 0%			2 2 3	N = 5 REC. = 1.5'
	5						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT118B

HTW DRILLING LOG

HOLE NO.

WT118B

SHEET 2

OF 8 SHEETS

PROJECT

HIMCO DUMP SUPERFUND SITE

INSPECTOR

MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	6						
	7						
	8						
	9	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 3.7'-5.0' EXCEPT TAN.	BREATHING ZONE HNU = 0.0 UNITS O ₂ = 21.0% LEL = 0%			2	N = 5 REC. = 1.5'
	10	POORLY GRADED SAND (SP): LOOSE, MOIST, TAN, FINE SAND, OUTWASH DEPOSITS.				2	
	11					3	
	12						WATER MEASURED @ 12.0'
	13						
	14	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 9.1'-10.0' EXCEPT WET.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 20.9% LEL = 0%				N = 1 (ONE 6" INTERVAL ONLY) REC. = 1.5'

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT118B

HTW DRILLING LOG

HOLE NO.
WT118B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 3
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	15					1	
	16						
	17						
	18						
	19	POORLY GRADED SAND (SP): SAME AS THE INTERVAL FROM 9.1'-10.0' EXCEPT WET.	BREATHING ZONE HNU = 0.1 UNITS				N = 1 (ONE 6" INTERVAL ONLY) REC. = 1.5'
	20	POORLY GRADED SAND WITH GRAVEL (SP): WET, GREY, MEDIUM TO COARSE SAND, 20%-25% GRAVEL, OUTWASH DEPOSITS.	O ₂ = 20.9% LEL = 0%			1	
	21						
	22						
	23						
	24	POORLY GRADED SAND WITH GRAVEL (SP): SAME AS THE INTERVAL FROM 19.1'-20.0' EXCEPT LOOSE.	BREATHING ZONE HNU = 0.1 UNITS O ₂ = 20.9% LEL = 0%			1	

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT118B

HTW DRILLING LOG

HOLE NO.
WT118B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 4
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
						2	N = 4 REC. = 0.9'
						2	
	25						
	26						
	27						
	28						
	29	WELL GRADED GRAVEL (GW): MEDIUM DENSE, WET, GREY, FINE TO COARSE GRAVEL. OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.1 UNITS O ₂ = 20.9% LEL = 0%			5	N = 17 REC. = 1.5'
						6	
						11	
	30						
	31						
	32						
	33						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT118B

HTW DRILLING LOG

HOLE NO.
WT118B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 5
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	34	WELL GRADED GRAVEL (GW): SAME AS THE INTERVAL FROM 28.5'-30.0' EXCEPT LOOSE.	BREATHING ZONE HNU = 0.0 UNITS O ₂ = 21.0% LEL = 0%			4	N = 9 REC. = 1.3'
						5	
						4	
	35						
	36						
	37						
	38						
	39	WELL GRADED GRAVEL (GW): SAME AS THE INTERVAL FROM 28.5'-30.0'.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 20.9% LEL = 0%			6	N = 15 REC. = 1.5'
						8	
						7	
	40						
	41						
	42						
	43						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT118B

HTW DRILLING LOG

HOLE NO.
WT118B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 6
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	44	WELL GRADED GRAVEL (GW): SAME AS THE INTERVAL FROM 28.5'-30.0' EXCEPT DENSE.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 20.9% LEL = 0%			10	N = 42 REC. = 1.1'
	45					17	
	46					25	
	47						
	48						
	49	WELL GRADED GRAVEL (GW): SAME AS THE INTERVAL FROM 28.5'-30.0'.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 21.0% LEL = 0%			6	N = 15 REC. = 1.0'
	50					8	
	51					7	
	52						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT118B

HTW DRILLING LOG

HOLE NO.
WT118B

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

SHEET 7
OF 8 SHEETS

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
53		POORLY GRADED SAND WITH GRAVEL (SP): MEDIUM DENSE, WET, GREY, MEDIUM TO COARSE SAND, 25%-30% GRAVEL, OUTWASH DEPOSITS.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 20.9% LEL = 0%				N = 22 REC. = 1.2'
54						7	
						9	
						13	
55		POORLY GRADED SAND WITH GRAVEL (SP): SAME AS THE INTERVAL FROM 53.5'-55.0'.	BREATHING ZONE HNU = 0.2 UNITS O ₂ = 21.0% LEL = 0%	D-1			N = 22 REC. = 1.3'
56							
57							
58							
59						13	
						10	
						12	
60							
61							
62							

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT118B

HOLE NO.
WT118B

SHEET 8

OF 8 SHEETS

PROJECT
HIMCO DUMP SUPERFUND SITE

INSPECTOR
MICHELLE BENAK

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	63						
	64	BOTTOM OF HOLE @ 63.5'					
	65						

PROJECT
HIMCO DUMP SUPERFUND SITE

HOLE NO.
WT118B

APPENDIX C:
GEOTECHNICAL TEST RESULTS

DEPARTMENT OF THE ARMY
MISSOURI RIVER DIVISION, CORPS OF ENGINEERS
DIVISION LABORATORY
OMAHA, NEBRASKA 68102

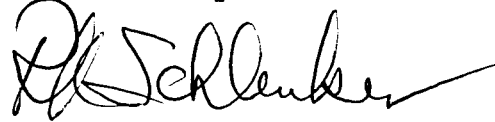
Subject: Classification Tests on Soil
Report Series No. 1
Project: HIMCO Superfund Site
Intended Use: _____
Source of Material: Borings WT 112A through WT 118B

Submitted by: Chief, CEMRO-ED-GB
Date Sampled: _____, Date Received: 9/5/95
Method of Test or Specification: EM 1110-2-1906

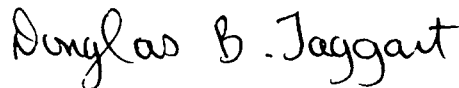
References: Omaha District Request dated 9/8/95
MIPR No. ENE 5712 dated 9/9/95

1. Subject testing has been performed in accordance with the above test method and reference. Test results are shown in Tables 1 and 2 and Figures through 5. All tests were performed on specimens obtained from jar samples. Preliminary results were sent on 27 October 95.
2. Unless otherwise notified, all remaining material will be disposed of 90 days after the date of this report.

Submitted by:



R. K. SCHLENKER P.E.
Chief, Soils, Conc and Matls Branch



DOUGLAS B. TAGGART
Director, MRD Laboratory

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

Sheet 1 of 1

TABLE 1 - SUMMARY OF CLASSIFICATION TESTS

Project: HIMCO Superfund Site

MRD Lab No. 3584

Holes WT 112A through WT 118B

=====

Note: By visual examination and classification, samples not tested were compared and grouped with typical test samples described below:

(a) Sand SP. Brown with White and Black. Fine to coarse sand. Nonplastic. Similar to Hole WT 112A, Sample 1 (1.8% Fines, 92.4% Sand, 5.8% Gravel; Cu-2.44, Cc-1.02).

(b) Sand SP. Grayish Brown with Black. Fine to medium sand. Nonplastic. Similar to Hole WT 112B, Sample 1 (1.5% Fines, 98.5% Sand; u-1.92, Cc-1).

(c) Gravelly Sand SP. Gray, Black and White. Fine sand to fine gravel. Nonplastic. Similar to Hole WT 114B, Sample 1 (1.5% Fines, 81.3% Sand, 17.2% Gravel; Cu-9.24, Cc-0.92).

(d) Sand SP. Yellowish Brown. Fine sand. Nonplastic. Similar to Hole WT 115A, Sample 1 (2.8% Fines, 96% Sand, 1.2% Gravel; Cu-2.7, Cc-1.32).

(e) Sand SP. Dark Gray with White. Fine to medium sand. Nonplastic. Similar to Hole WT 116A, Sample 1 (1.3% Fines, 98.2% Sand, 0.5% Gravel; Cu-2.46, Cc-0.86).

DATE: 11/05/2005

BOOKING: NY 112A through NY 118B

NR0 LAB NO.

853

1000

RAMS.

“SINCE 1945”

DEPTW TO WATER TANK:

DATE: _____

10,27133

[illegible]

W.O. No. HSS
 Req. No. ENE 5712
 Contract No.

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
 420 SOUTH 18th STREET - OMAHA, NE 68102-2586

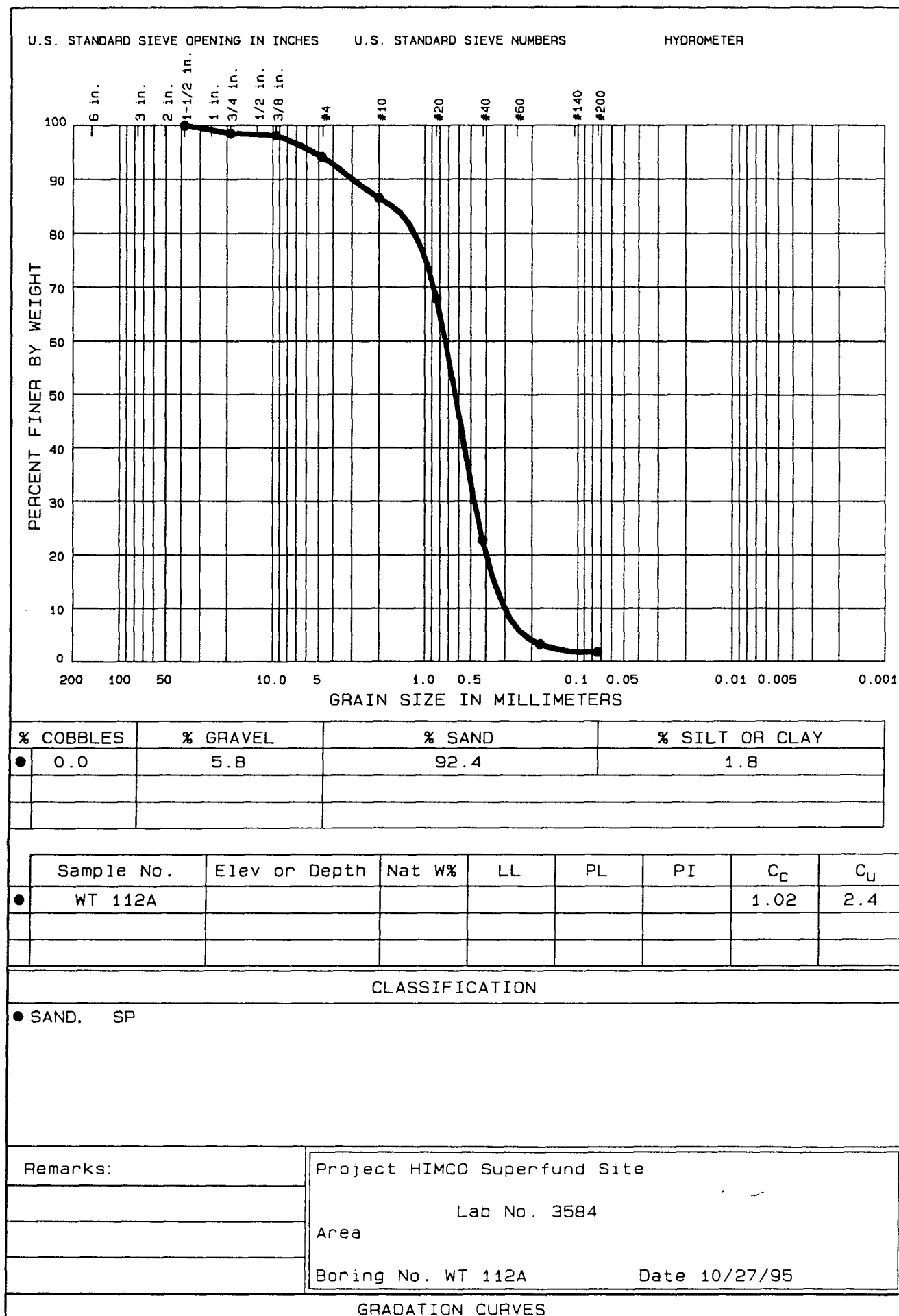


Figure 1

W.O. No. HSS
 Req. No. ENE 5712
 Contract No.

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
 420 SOUTH 18th STREET - OMAHA, NE 68102-2586

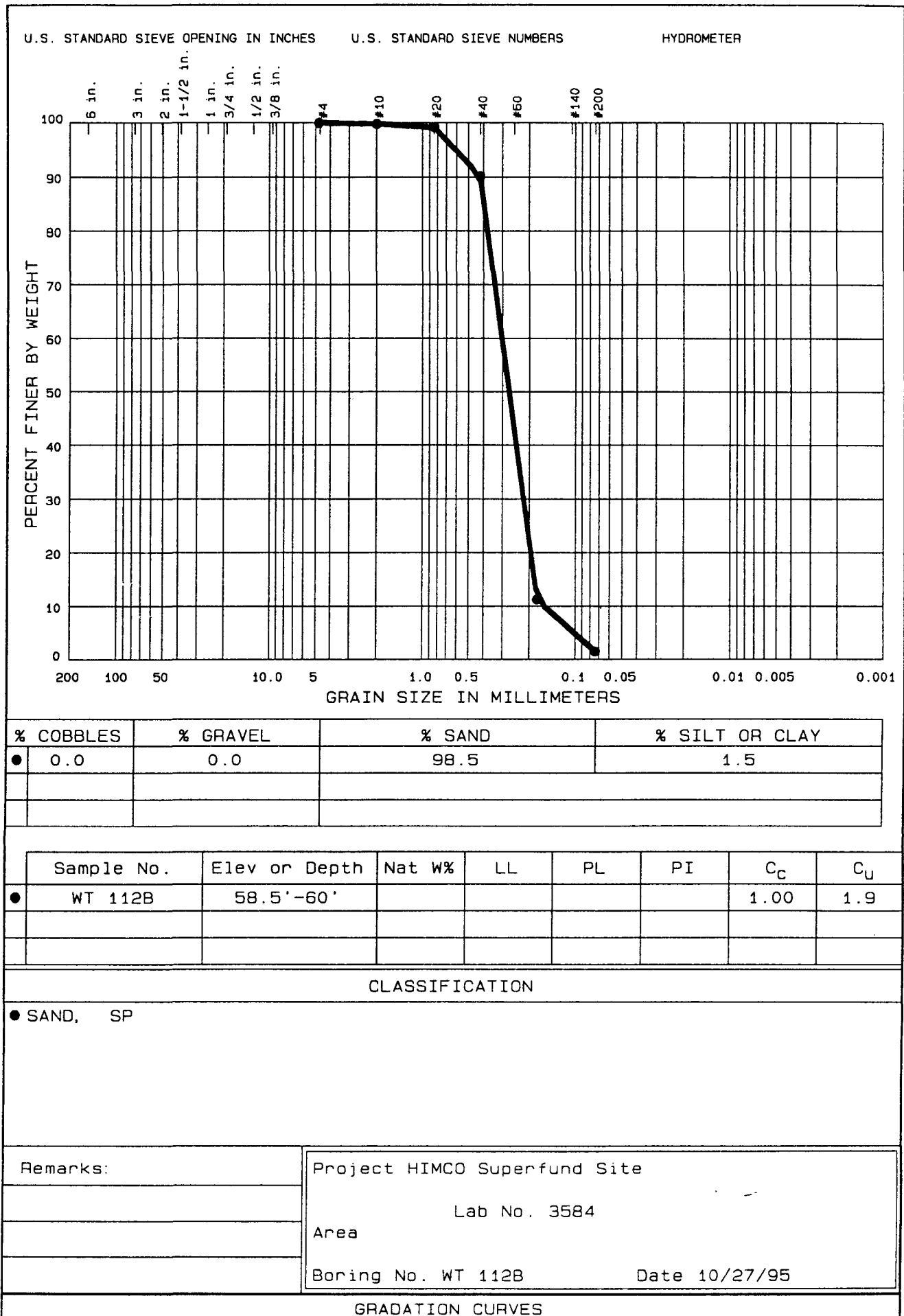


Figure 2

W.O. No. HSS
 Req. No. ENE 5712
 Contract No.

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
 420 SOUTH 18th STREET - OMAHA, NE 68102-2586

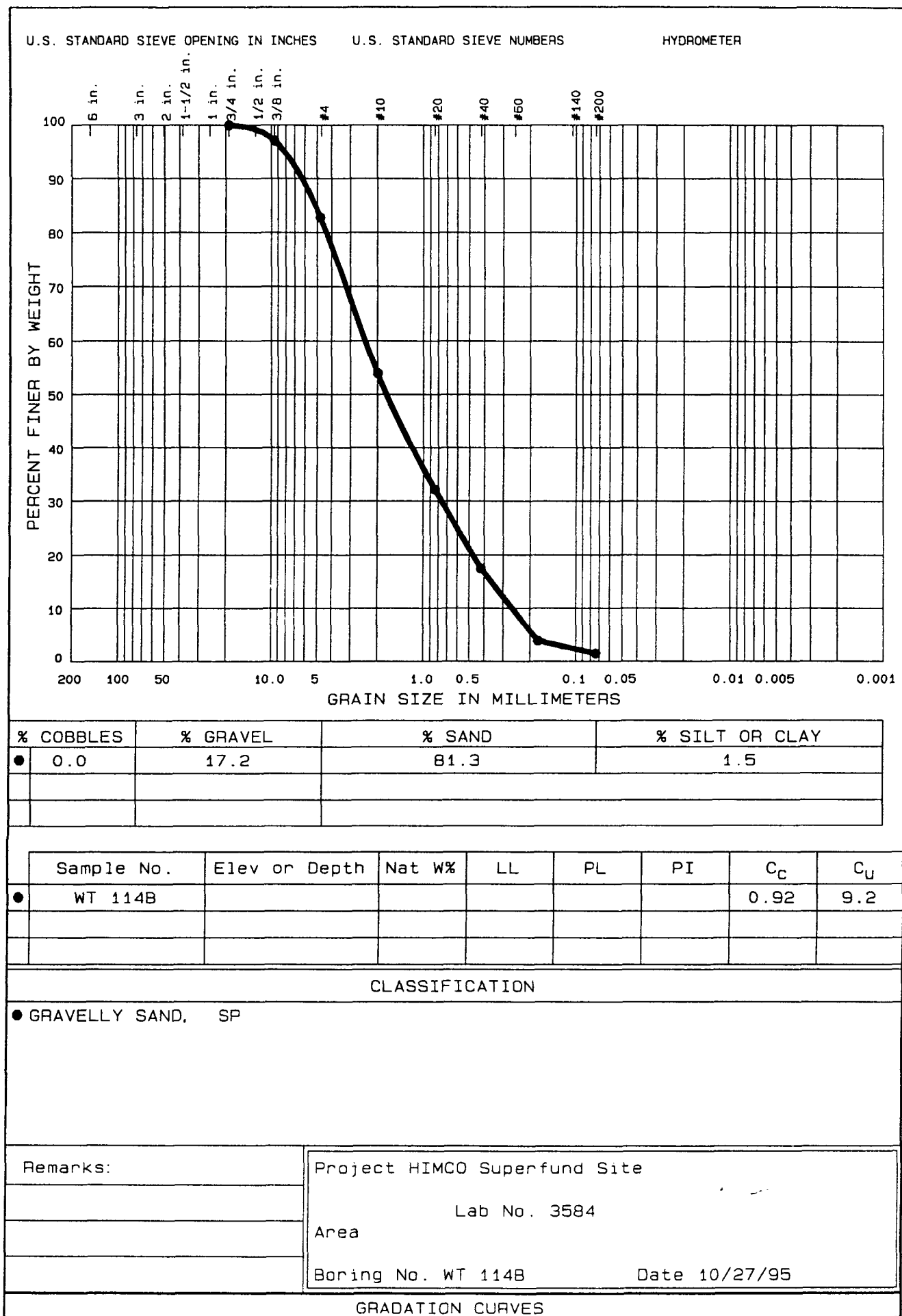


Figure 3

W.O. No. HSS
 Req. No. ENE 5712
 Contract No.

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
 420 SOUTH 18th STREET - OMAHA, NE 68102-2586

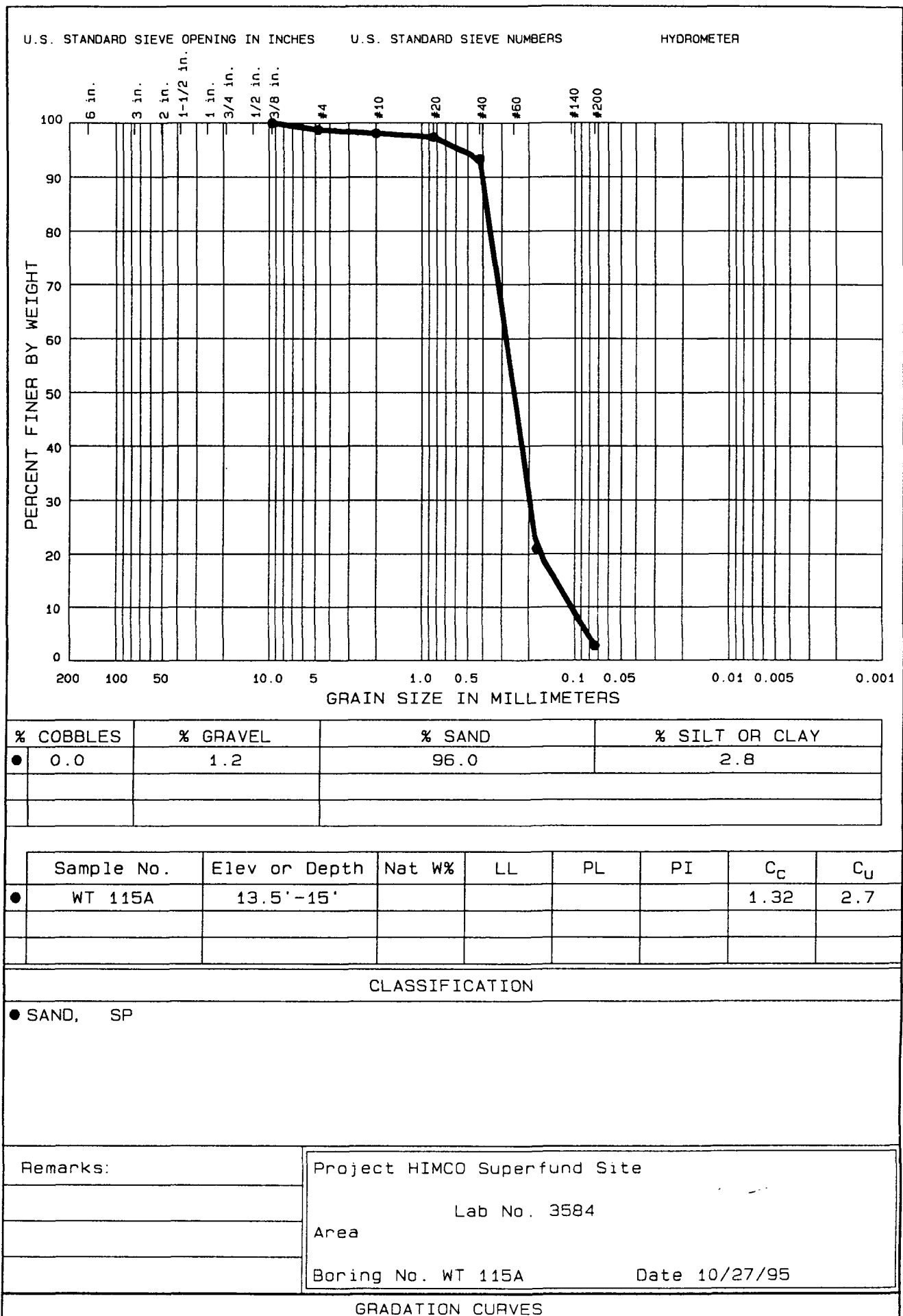


Figure 4

W.O. No. HSS
 Req. No. ENE 5712
 Contract No.

CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB
 420 SOUTH 18th STREET - OMAHA, NE 68102-2586

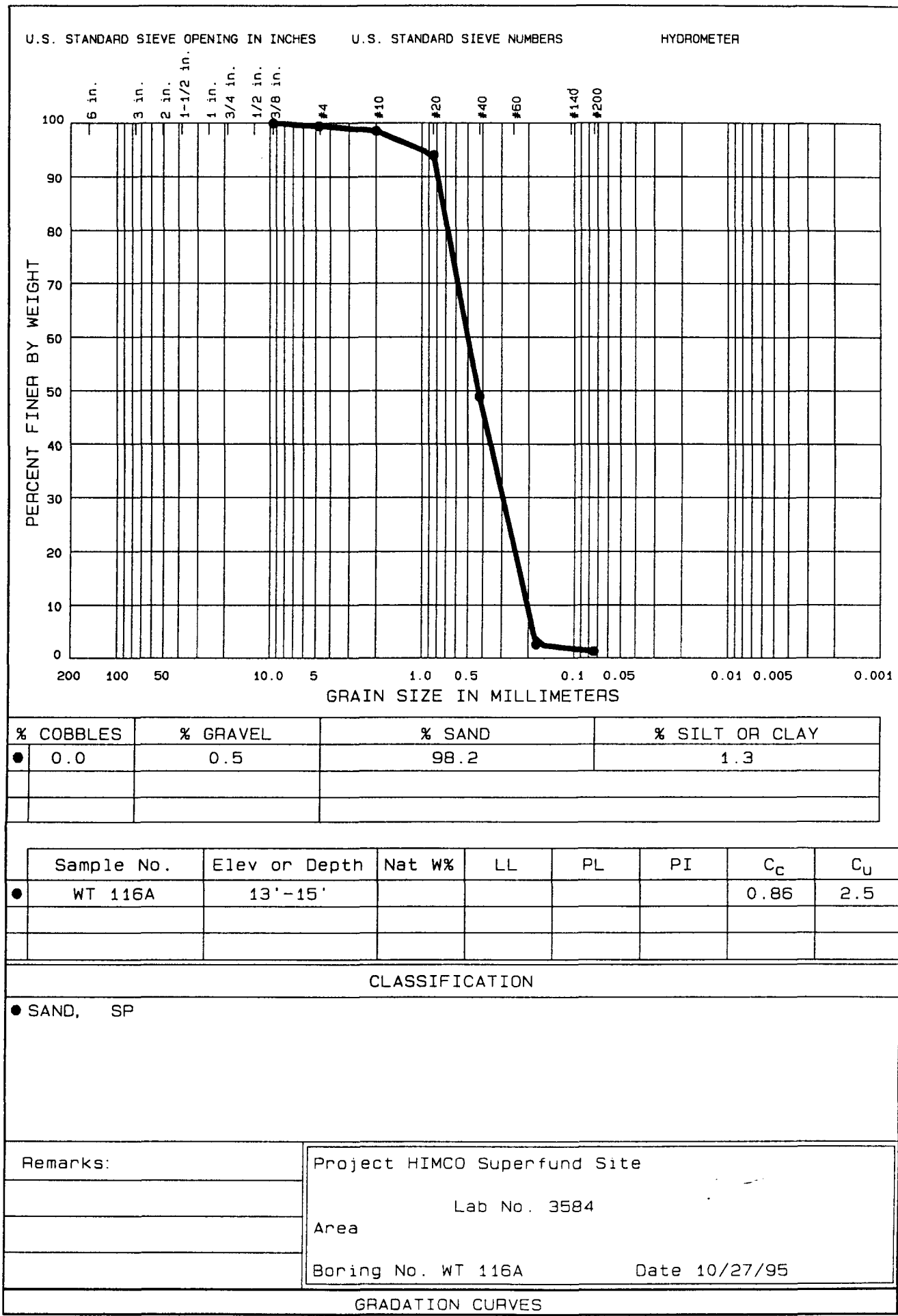


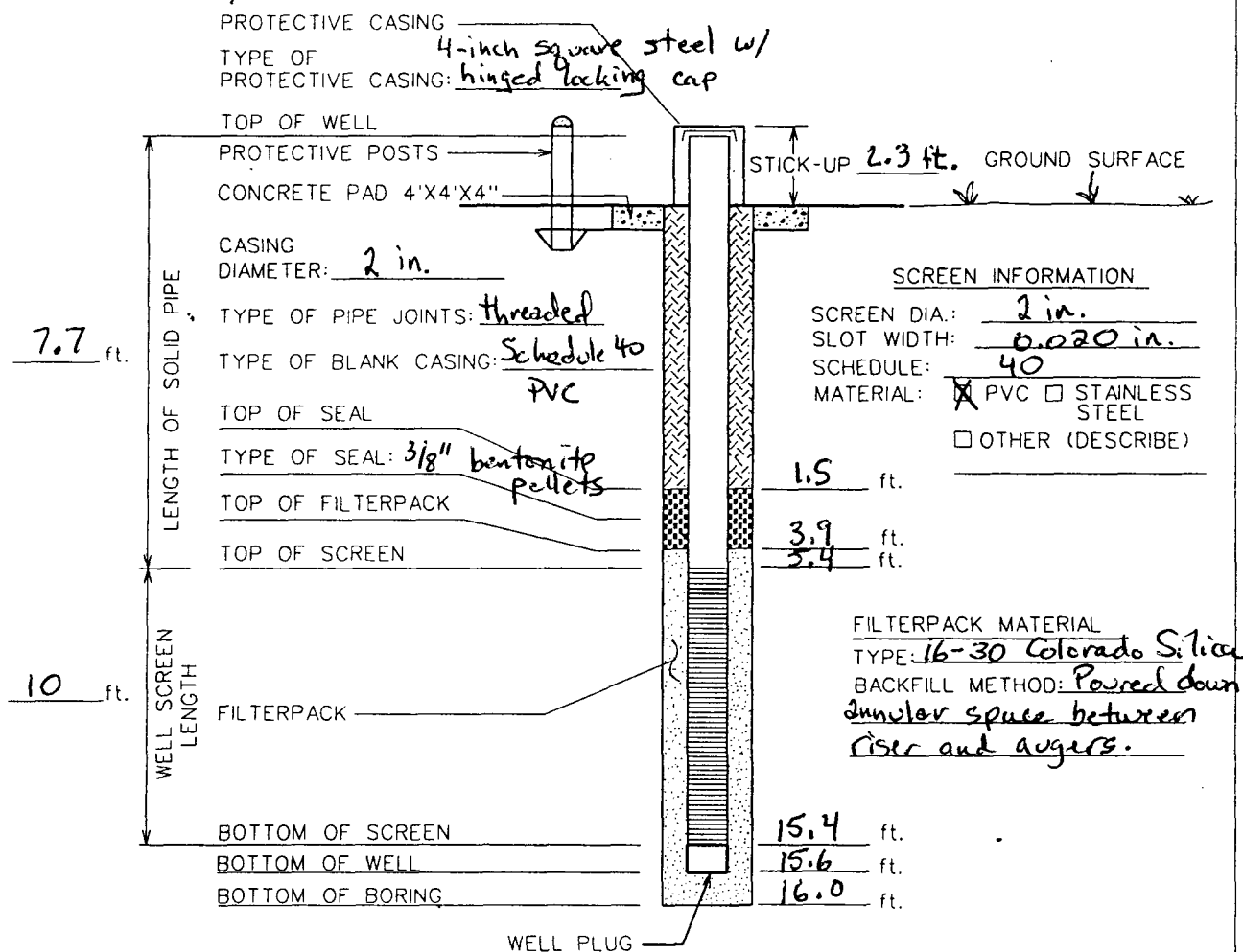
Figure 5

APPENDIX D:
MONITORING WELL CONSTRUCTION DIAGRAMS

ELEVATION GROUND WATER			PROJECT
DATE INSTALLED	STARTED	COMPLETED	LOCATION (Coordinates or Station)
	8-23-95	8-24-95	N. 1533653.49 E. 406824.67
ELEVATION TOP OF HOLE			SIGNATURE OF INSPECTOR
RISER - 765.90 GROUND - 763.6			Michelle Bernak
TOTAL DEPTH OF HOLE			HOLE NO.
16.0 ft.			WT112A

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

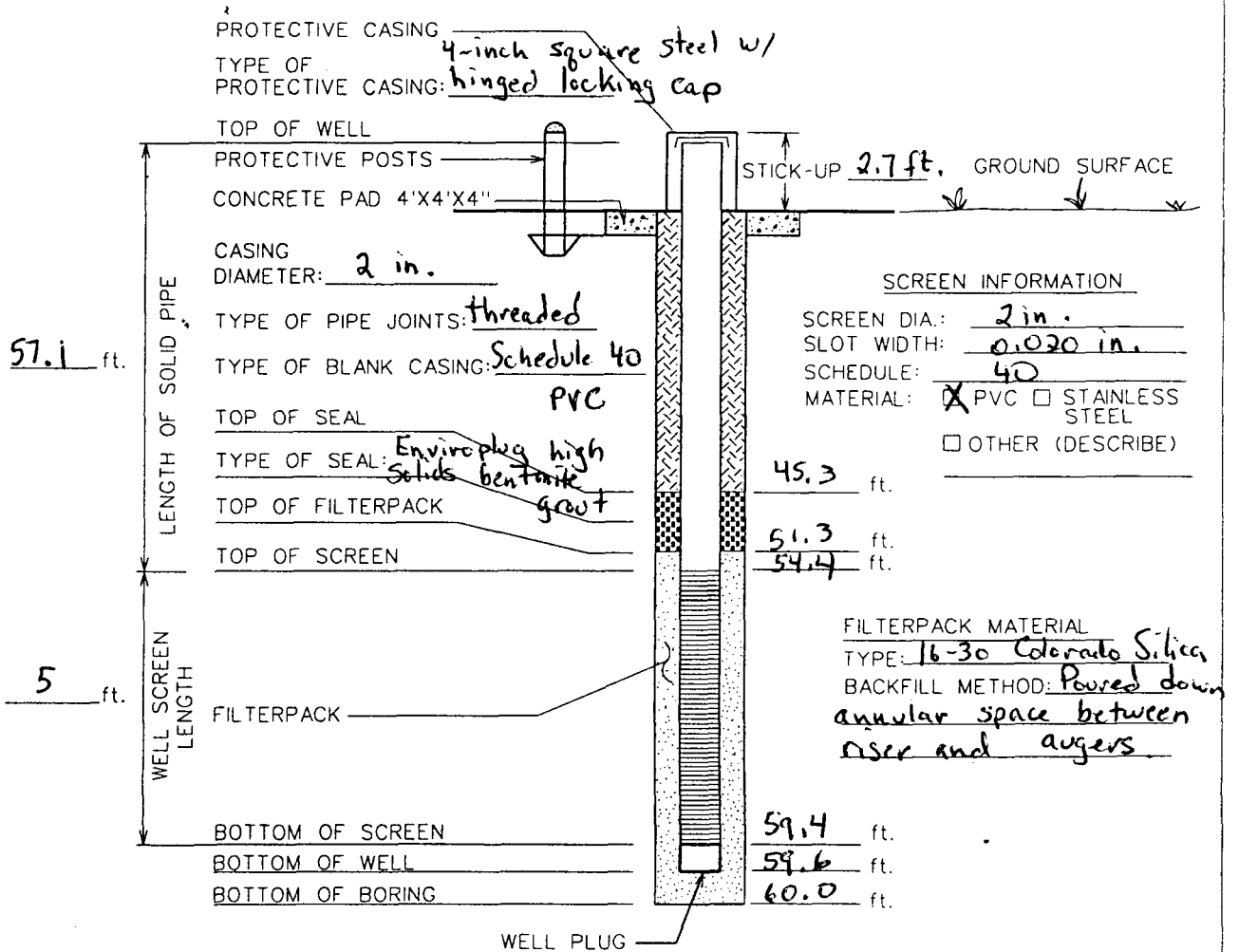
WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL 8-23-95 10:07am 9.5ft.
 8-24-95 9:56am 8.5ft.

ELEVATION GROUND WATER			PROJECT Himco Dump SUPERFUND SITE	
DATE INSTALLED	STARTED 8-23-95	COMPLETED 8-24-95	LOCATION (Coordinates or Station) N. 1533653.01 E. 406834.06	
ELEVATION TOP OF HOLE RISER - 766.09 GROUND - 763.4			SIGNATURE OF INSPECTOR <i>Michelle Benak</i>	
TOTAL DEPTH OF HOLE 60.0 ft.			HOLE NO. WT112B	

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



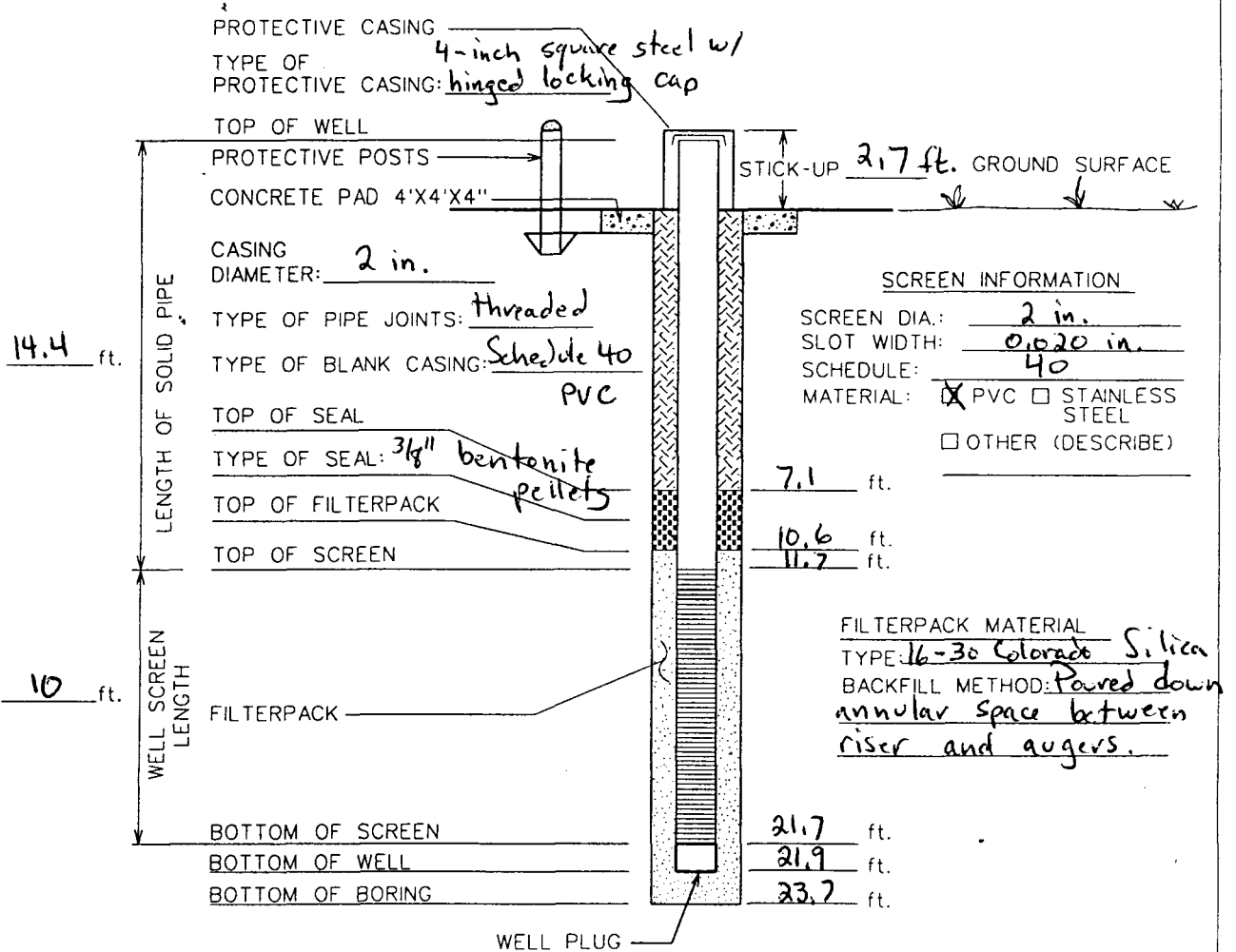
WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS
 DATE/TIME/LEVEL **8-24-95 9:58 AM 8.8 ft.**

ELEVATION GROUND WATER			PROJECT Himco Dump SUPERFUND SITE
DATE INSTALLED	STARTED 8-10-95	COMPLETED 8-11-95	LOCATION (Coordinates or Station) N. 1533608.69 E. 407789.11
ELEVATION TOP OF HOLE RISER - 771.85 GROUND - 769.2			SIGNATURE OF INSPECTOR Michelle Benak
TOTAL DEPTH OF HOLE 23.7 ft.			HOLE NO. WT113A

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS

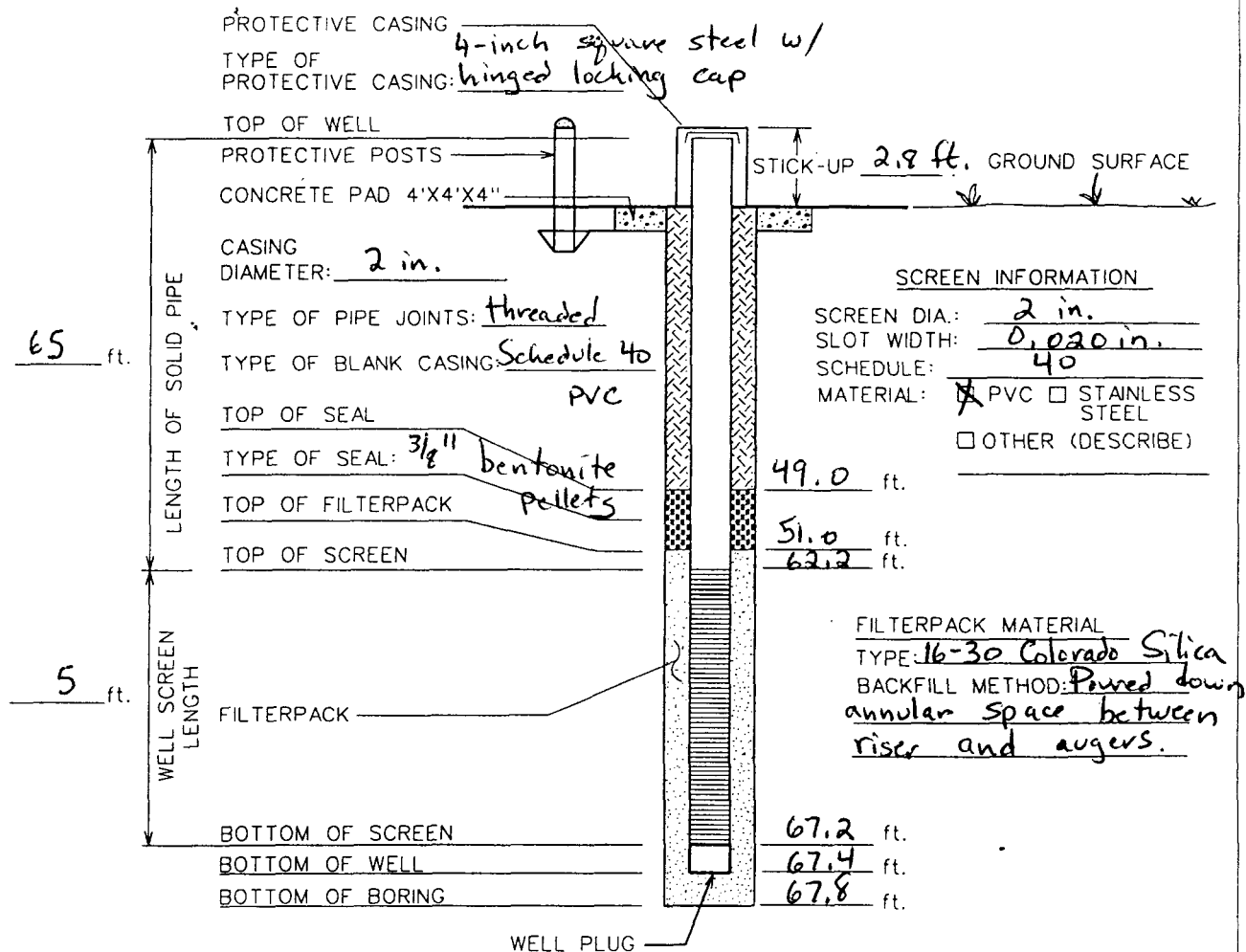
DATE/TIME/LEVEL

8-10-95	16.5 ft.
8-11-95 2:30 PM	15.75 ft.

ELEVATION GROUND WATER			PROJECT HIMCO DUMP SUPERFUND SITE	
DATE INSTALLED	STARTED 8-10-95	COMPLETED 8-11-95	LOCATION (Coordinates or Station) N. 1533604.43 E. 407779.02	
ELEVATION TOP OF HOLE RISER - 772.06 GROUND - 769.3			SIGNATURE OF INSPECTOR <i>Michelle Bernal</i>	
TOTAL DEPTH OF HOLE 67.8 ft.			HOLE NO. WT113B	

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS

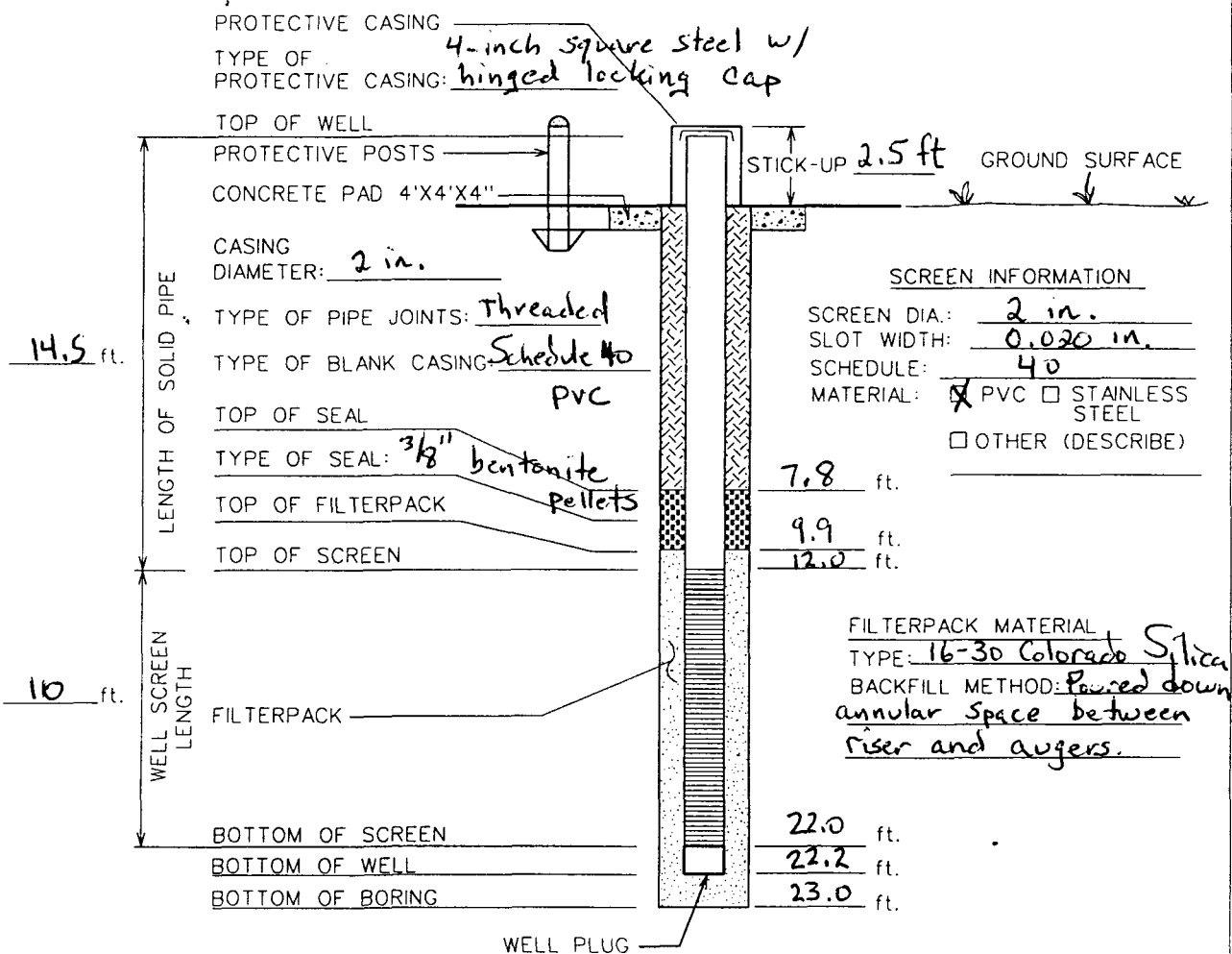
DATE/TIME/LEVEL

8-9-95	10:15 AM	16.8 ft.
8-10-95	9:03 AM	16.3 ft.
8-11-95	2:15 PM	16.0 ft.

ELEVATION GROUND WATER			PROJECT Himco Dump Superfund Site
DATE INSTALLED	STARTED 8-21-95	COMPLETED 8-22-95	LOCATION (Coordinates or Station) N. 1531843.97 E. 407997.29
ELEVATION TOP OF HOLE RISER - 769.19 GROUND - 766.7			SIGNATURE OF INSPECTOR <i>Michelle Bernal</i>
TOTAL DEPTH OF HOLE 23.0 ft.			HOLE NO. WT114A

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS

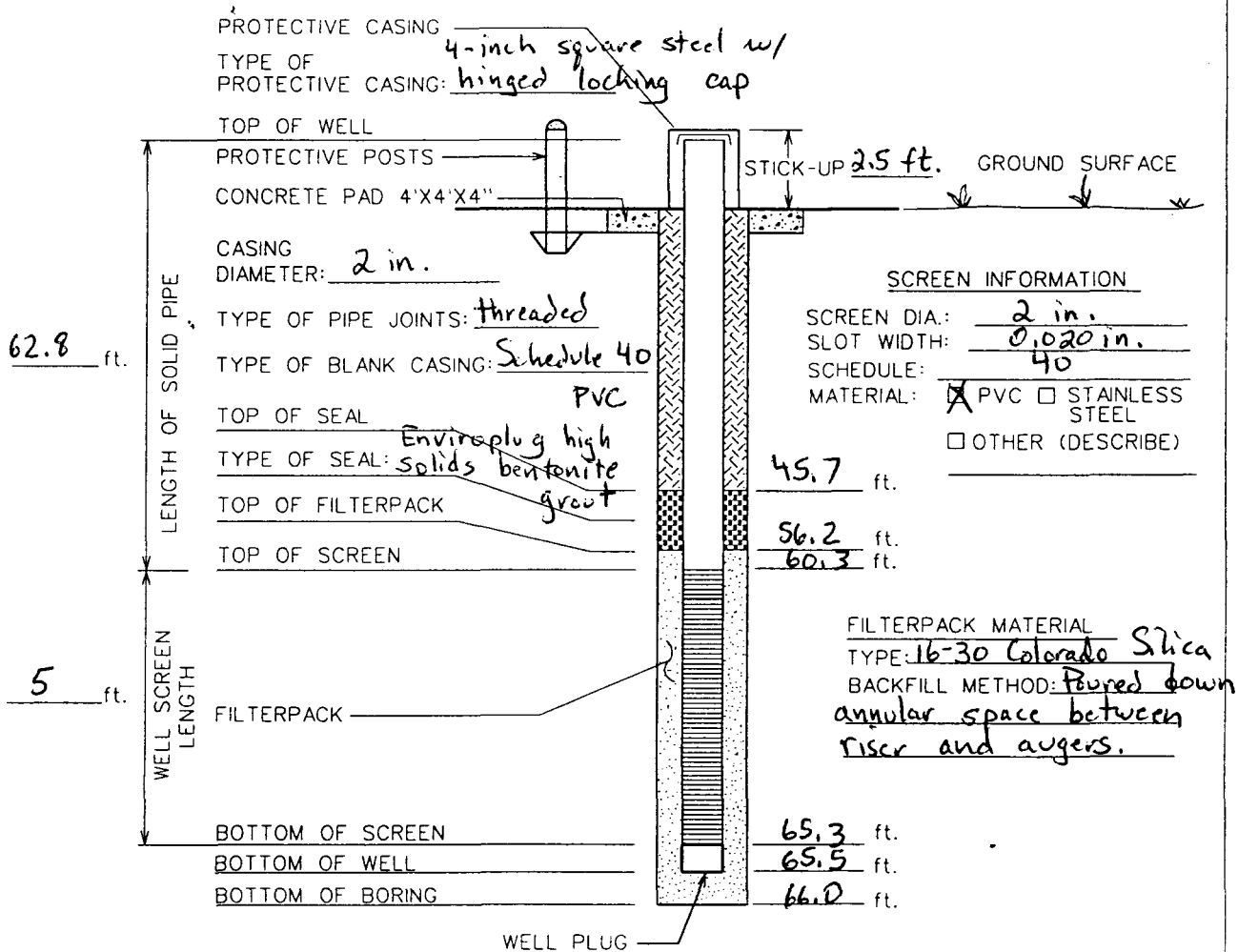
DATE/TIME/LEVEL

8-21-95	1:39 PM	16.0 ft.
8-22-95	7:47 AM	15.1 ft.

ELEVATION GROUND WATER			PROJECT Himco Dump SUPERFUND SITE
DATE INSTALLED	STARTED 8-22-95	COMPLETED 8-23-95	LOCATION (Coordinates or Station) N. 1531834.38 E. 407995.71
ELEVATION TOP OF HOLE RISER - 769.37 GROUND - 766.9			SIGNATURE OF INSPECTOR <i>Michelle Benak</i>
TOTAL DEPTH OF HOLE 66.0 ft.			HOLE NO. WT114B

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

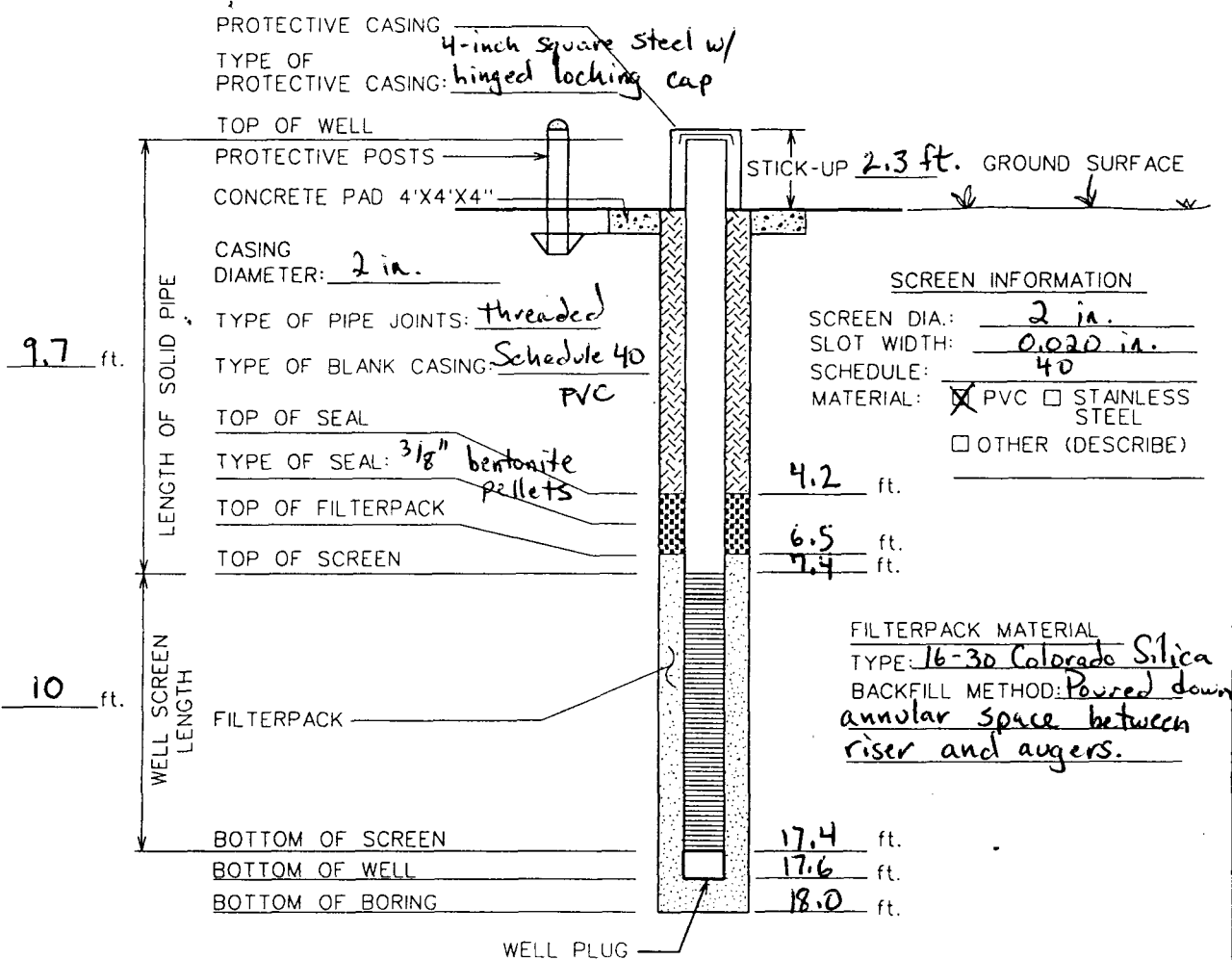
WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL **8-23-95 9:00 AM 15.2 ft.**

ELEVATION GROUND WATER			PROJECT Himco Dump SUPERFUND SITE	
DATE INSTALLED	STARTED 8-22-95	COMPLETED 8-23-95	LOCATION (Coordinates or Station) N. 1531675.84 E. 407261.44	
ELEVATION TOP OF HOLE RISER - 763.87 GROUND - 763.6			SIGNATURE OF INSPECTOR <i>Michelle Benet</i>	
TOTAL DEPTH OF HOLE 18.0 ft.			HOLE NO. WT115A	

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

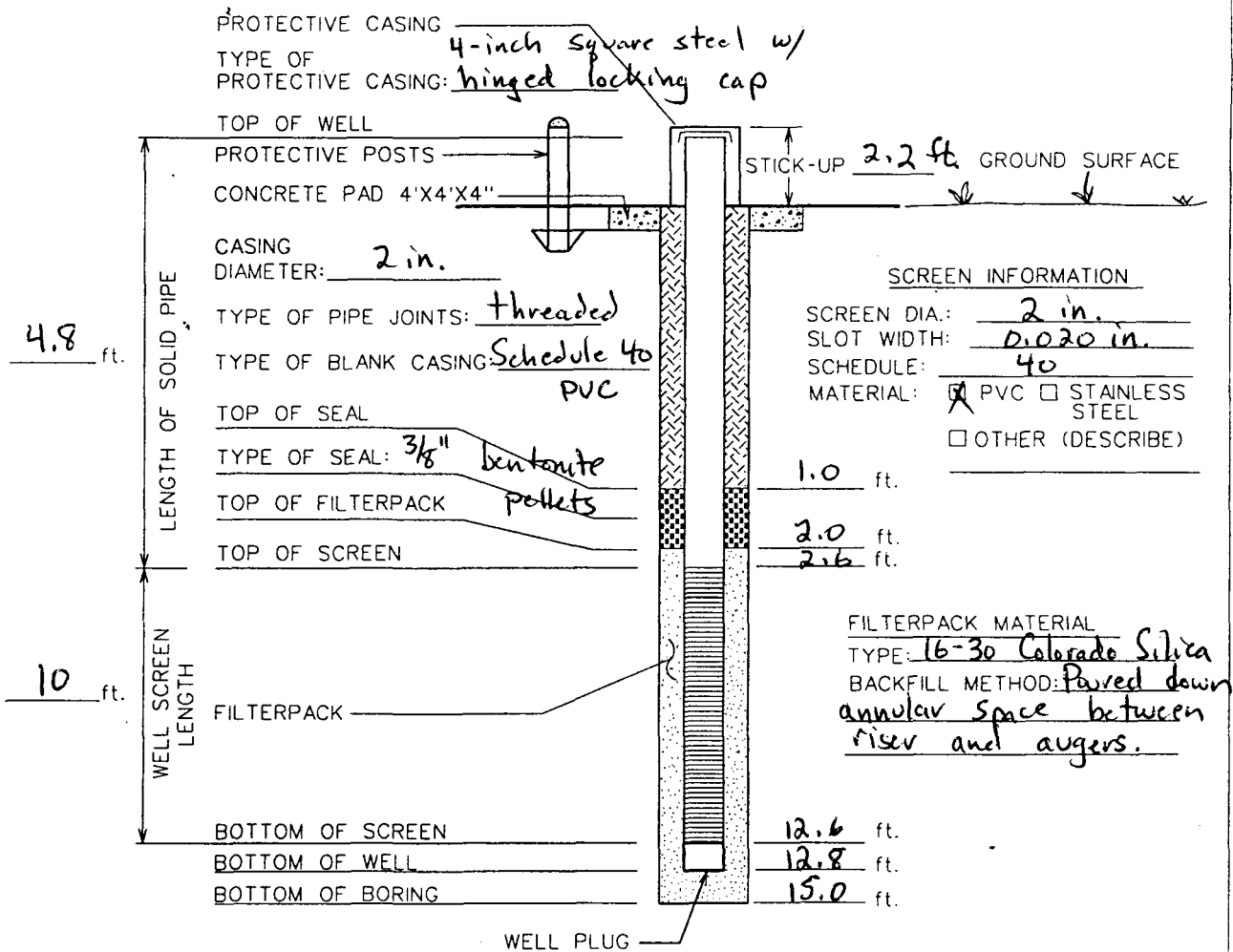
WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL **8-22-95 1:00 PM 12.2 ft.**

ELEVATION GROUND WATER			PROJECT
DATE INSTALLED			HIMCO DUMP SUPERFUND SITE
STARTED	COMPLETED	LOCATION (Coordinates or Station)	
8-17-95	8-18-95	N. 1531925.50 E. 406784.96	
ELEVATION TOP OF HOLE			SIGNATURE OF INSPECTOR
RISER - 763.86 GROUND - 761.7			Michelle L. Enal
TOTAL DEPTH OF HOLE			HOLE NO.
15.0 ft.			WT116A

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS

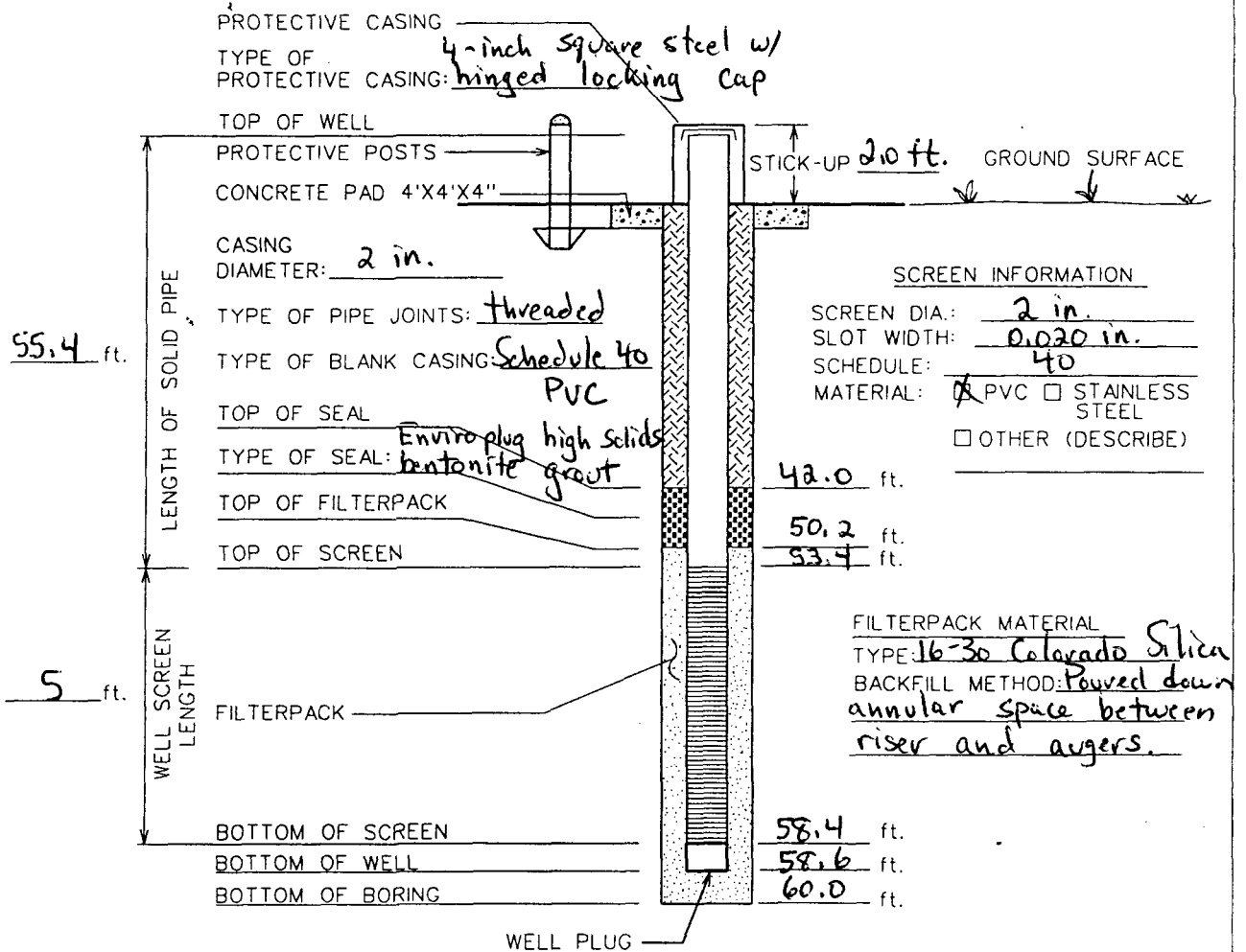
DATE/TIME/LEVEL

8-17-95	1:45 PM	10.6 ft.
8-18-95	7:40 AM	7.9 ft.

ELEVATION GROUND WATER			PROJECT Himco Dump SUPERFUND SITE	
DATE INSTALLED	STARTED 8-17-95	COMPLETED 8-18-95	LOCATION (Coordinates or Station) N. 1531931.04 E. 406775.79	
ELEVATION TOP OF HOLE RISE - 763.89 GROUND - 761.9			SIGNATURE OF INSPECTOR <i>Michelle Bernick</i>	
TOTAL DEPTH OF HOLE 60.0 ft.			HOLE NO. WT116B	

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS

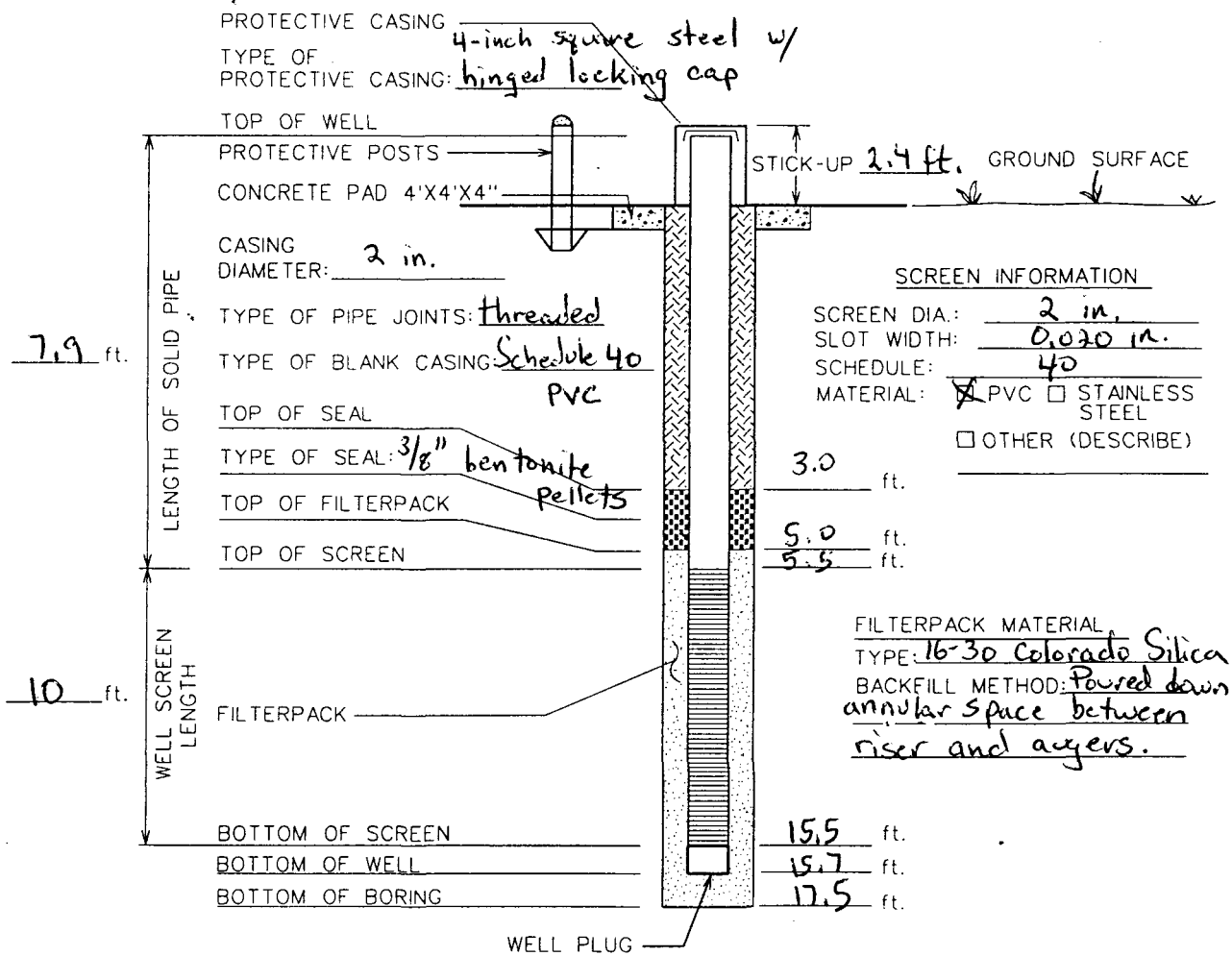
DATE/TIME/LEVEL

8-16-95	10:05 AM	2.4 ft.
8-16-95	12:40 PM	9.5 ft.
8-17-95	7:35 AM	2.6 ft.
8-18-95	7:00 AM	10.9 ft.

ELEVATION GROUND WATER			PROJECT HIMCO DUMP SUPERFUND SITE
DATE INSTALLED	STARTED 8-15-95	COMPLETED 8-17-95	LOCATION (Coordinates or Station) N. 1532201, 98 E. 405908. 93
ELEVATION TOP OF HOLE Riser - 767.19 GROUND - 764.8			SIGNATURE OF INSPECTOR <i>Michelle Benet</i>
TOTAL DEPTH OF HOLE 17.5 ft.			HOLE NO. WT117A

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

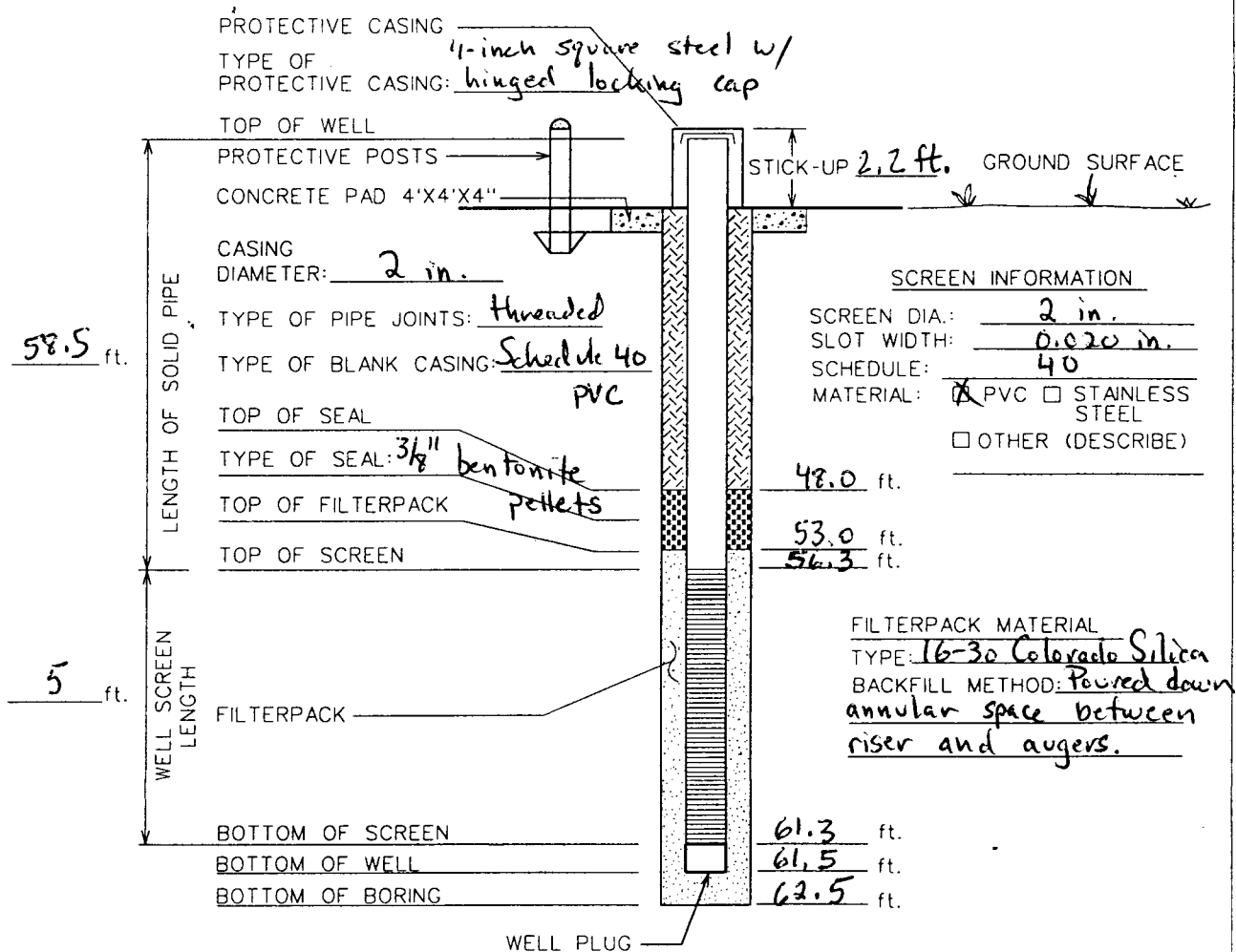
WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL **8-18-95 11:00 AM 11.3 ft.**

ELEVATION GROUND WATER			PROJECT Himco Dump SUPERFUND SITE
DATE INSTALLED	STARTED 8-14-95	COMPLETED 8-17-95	LOCATION (Coordinates or Station) N. 1532202.51 E. 405796.41
ELEVATION TOP OF HOLE RISER - 766.60 GROUND - 764.4			SIGNATURE OF INSPECTOR <i>Michelle Benek</i>
TOTAL DEPTH OF HOLE 62.5 ft.			HOLE NO. WT117B

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

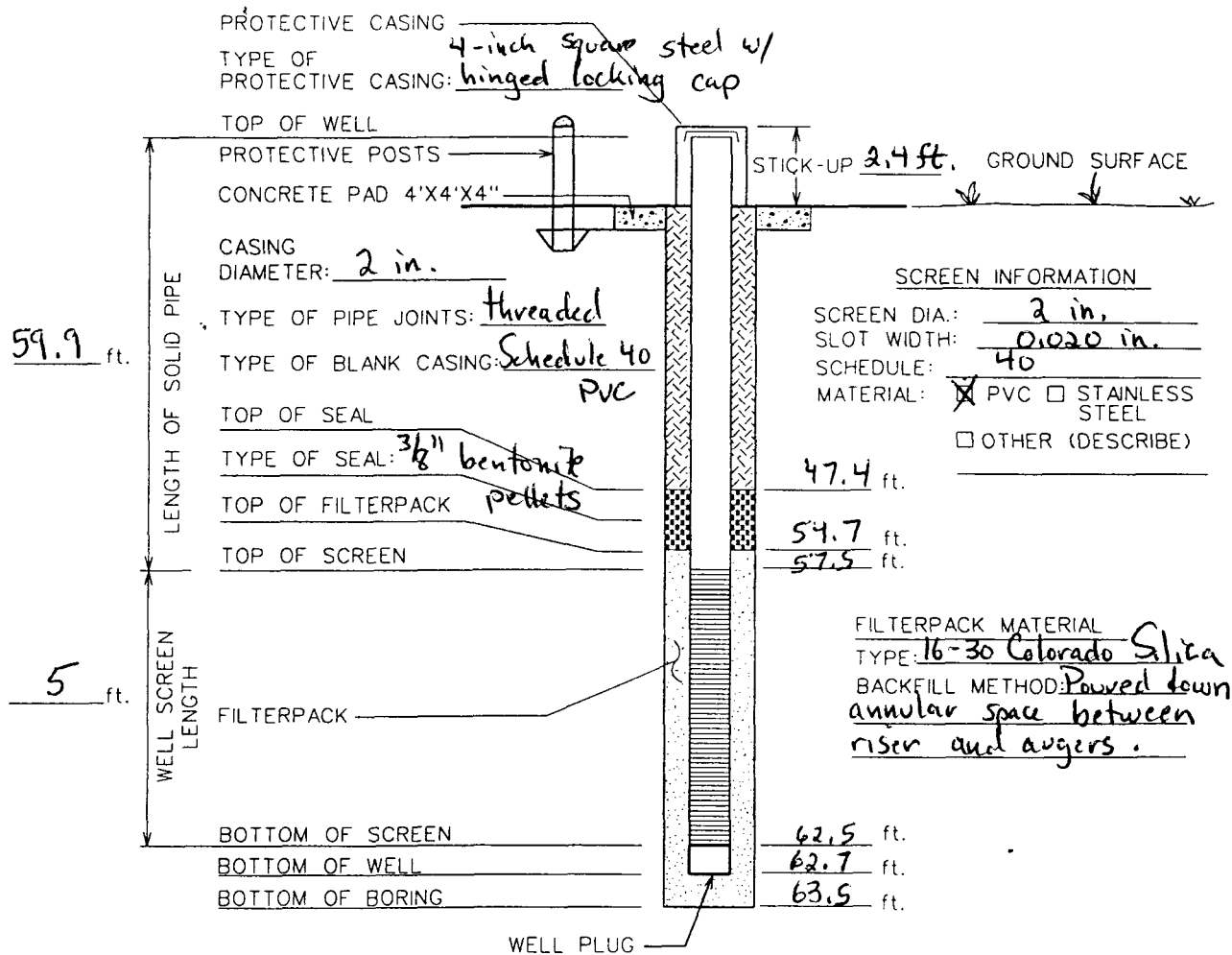
WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL	8-14-95	8:25 AM	11.5 ft.
	8-15-95	7:51 AM	11.0 ft.
	8-18-95	11:54 AM	10.3 ft.

ELEVATION GROUND WATER			PROJECT Himco Dump SUPERFUND SITE	
DATE INSTALLED	STARTED 8-18-95	COMPLETED 8-21-95	LOCATION (Coordinates or Station) N. 1531917.55 E. 406361.16	
ELEVATION TOP OF HOLE RISER - 766.49 GROUND - 764.1			SIGNATURE OF INSPECTOR <i>Michelle Benolt</i>	
TOTAL DEPTH OF HOLE 63.5 ft.			HOLE NO. WT118B	

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL
8-18-95 2:22 PM 12.0 ft.
8-21-95 9:24 AM 11.0 ft.

APPENDIX E:
MONITORING WELL DEVELOPMENT RECORDS

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WTE1
Location: Elkhart, IN	TOC Elevation: 765.75
Well Coordinates: N. 1531566.72 E. 407131.36	Ground Elevation: 762.9
Date Well Installed: 10/11/77	Installed Well Depth (TOC): 84.0'
Date Well Developed: 8/25/95	Screened Interval (TOC): 74.0' to 84.0'
Fluid Losses During Drilling: N/A	Casing Diameter: 5.0" Schedule 40 PVC

DEVELOPMENT DATA

<input type="checkbox"/> Initial Development <input checked="" type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: <u>13.59 ft</u> Time: <u>1320</u> Final: <u>10.75 ft</u> Time: <u>1429</u>		Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____
Sounded Depth (TOC): Initial: <u>81.04 ft</u> Time: <u>1320</u> Final: <u>81.24 ft</u> Time: <u>1431</u>		
Development Start: Date: <u>8/25/95</u> Time: <u>1101</u>		Development Finish: Date: <u>8/25/95</u> Time: <u>1425</u>

Development Method (Completely describe development method to include all equipment and procedures):
 Surged well with bailer using drill rig and pumped with Grundfos Rediflow 4 at 10.0 gpm.

Misc. Notes:

Submerged Volume Calculation:
 81.0 ft - 13.6 ft = 67.4 ft * 1.02 gal/ft = 68.7 gal

One Submerged Volume: 68.7 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1404	10.0	0	8.35	15.9	4.7	-74.3			
1408	10.0	40.0	8.28	16.1	7.4	-74.1			
1411	10.0	70.0	8.37	15.2	9.5	-78.2			
1414	10.0	100.0	8.48	14.5	3.0	-84.3			
1417	10.0	130.0	8.62	13.3	4.2	-91.8			
1420	10.0	160.0	8.63	13.1	3.2	-92.1			

Name: Michelle Benak

Firm: US Army Corps of Engineers

Signature: *Michelle Benak*

Date: 8/25/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WTE1

Location: Elkhart, IN

TOC Elevation: 765.75

DEVELOPMENT DATA (CONT.)

Misc. Notes:

[illegible]

Name: Michelle Benak

Firm: US Army Corps of Engineers

Signature

*Michelle Benak / Zin Jernu

Date: 8/25/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT01
Location: Elkhart, IN	TOC Elevation: 762.83
Well Coordinates: N. 1532407.14 E. 407876.93	Ground Elevation: 762.83
Date Well Installed: 5/01/79	Installed Well Depth (TOC): 30.0'
Date Well Developed: 8/28/95	Screened Interval (TOC): 25.0' to 30.0'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input type="checkbox"/> Initial Development <input checked="" type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: <u>11.2 ft</u> Time: <u>1015</u> Final: <u>14.51 ft</u> Time: <u>1230</u>		Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____
Sounded Depth (TOC): Initial: <u>29.34 ft</u> Time: <u>1017</u> Final: <u>29.44 ft</u> Time: <u>1232</u>		
Development Start: Date: <u>8/28/95</u> Time: <u>1045</u>		Development Finish: Date: <u>8/28/95</u> Time: <u>1230</u>

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.5 gpm.

Misc. Notes:

Submerged Volume Calculation:

29.3 ft - 11.2 ft = 18.1 ft * 0.16 gal/ft = 2.9 gal

One Submerged
Volume: 2.9 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1114	0.5	2.0	6.55	15.1	>200	-7.6			
1118	0.5	4.0	6.96	13.9	>200	-23.2			
1122	0.5	6.0	7.11	13.7	188.9	-26.4			
1126	0.5	8.0	7.20	13.2	121.0	-30.7			
1130	0.5	10.0	7.24	13.3	113.5	-33.3			
1134	0.5	12.0	7.37	13.1	90.2	-39.9			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/28/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT01

Location: Elkhart, IN

TOC Elevation: 762.83

DEVELOPMENT DATA (CONT.)

Misc. Notes:

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1138	0.5	14.0	7.43	13.0	>200	-42.6			
1142	0.5	16.0	7.46	13.5	>200	-44.3			
1146	0.5	18.0	7.47	13.8	>200	-45.2			
1150	0.5	20.0	7.51	13.9	137.1	-47.1			
1154	0.5	22.0	7.53	13.3	>200	-47.8			
1158	0.5	24.0	7.54	13.0	>200	-48.4			
1202	0.5	26.0	7.55	13.1	112.6	-48.5			
1206	0.5	28.0	7.56	13.1	63.5	-49.3			
1210	0.5	30.0	7.57	12.7	60.5	-50.2			
1214	0.5	32.0	7.58	13.1	52.8	-50.7			
1218	0.5	34.0	7.6	13.0	46.8	-51.2			
1222	0.5	36.0	7.6	13.1	58.8	-50.9			
1226	0.5	38.0	7.6	13.1	57.0	-51.9			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen / Carolyn Schwafel*

Date: 8/28/95

Page 2 **of** 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT101A
Location: Elkhart, IN	TOC Elevation: 764.34
Well Coordinates: N. 1531629.81 E. 407616.98	Ground Elevation: 762.0
Date Well Installed: 11/12/90	Installed Well Depth (TOC): 18.73'
Date Well Developed: 8/24/95	Screened Interval (TOC): 7.83 to 17.73 ft
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Stainless Steel

DEVELOPMENT DATA

<input type="checkbox"/> Initial Development <input checked="" type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: <u>12.25 ft</u> Time: <u>1015</u> Final: <u>12.25 ft</u> Time: <u>1135</u>		Sounded Depth (TOC): Initial: <u>18.74 ft</u> Time: <u>1016</u> Final: <u>18.74 ft</u> Time: <u>1136</u>
Development Start: Date: <u>8/24/95</u> Time: <u>1030</u>		Development Finish: Date: <u>8/24/95</u> Time: <u>1131</u>
Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____		

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.25 gpm.

Misc. Notes:

Submerged Volume Calculation:
 18.7 ft - 12.25 ft = 6.4 ft * 0.16 gal/ft = 1.0 gal

One Submerged Volume: 1.0 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1055	0.25	1.0	7.35	24.7	>200	-32.5			
1059	0.25	2.0	7.11	20.4	47.8	-19.9			
1103	0.25	3.0	7.06	19.5	31.6	-17.7			
1107	0.25	4.0	7.22	20.6	126.1	-24.0			
1111	0.25	5.0	7.08	21.6	31.5	-19.0			
1115	0.25	6.0	7.01	22.7	32.6	-15.5			

Name: Tim Jensen and Carolyn Schwafel	Firm: US Army Corps of Engineers
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Signature: <i>Tim Jensen Carolyn Schwafel</i>	Date: 8/24/95	Page <u>1</u> of <u>2</u>
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USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT101B
Location: Elkhart, IN	TOC Elevation: 764.23
Well Coordinates: N. 1531617.03 E. 407621.69	Ground Elevation: 761.9
Date Well Installed: 12/14/90	Installed Well Depth (TOC): 100.53'
Date Well Developed: 8/24/95	Screened Interval (TOC): 95.53' to 100.53'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Stainless Steel

DEVELOPMENT DATA

<input type="checkbox"/> Initial Development <input checked="" type="checkbox"/> Redevelopment		Weather Conditions: Warm, sunny, 90's
Static Water Level (TOC): Initial: <u>13.27</u> ft Time: <u>0825</u> Final: <u>12.32</u> ft Time: <u>0955</u>		Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____
Sounded Depth (TOC): Initial: <u>100.74</u> ft Time: <u>0827</u> Final: <u>100.84</u> ft Time: <u>0956</u>		
Development Start: Date: <u>8/24/95</u> Time: <u>0830</u>		Development Finish: Date: <u>8/24/95</u> Time: <u>0955</u>

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 1.5 gpm.

Misc. Notes:

Submerged Volume Calculation:
 $100.7 \text{ ft} - 13.3 \text{ ft} = 87.4 \text{ ft} * 0.16 \text{ gal/ft} = 14.0 \text{ gal}$

One Submerged Volume: 14.0 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
0934	1.5	14.0	7.63	15.0	5.8	-43.3			
0939	1.5	21.0	7.48	14.5	2.1	-38.6			
0944	1.5	28.0	7.49	13.6	1.9	-39.2			
0949	1.5	35.0	7.51	14.0	1.5	-39.2			
0954	1.5	42.0	7.52	13.8	1.5	-39.7			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/24/95

Page 1 of 1

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT102A
Location: Elkhart, IN	TOC Elevation: 769.09
Well Coordinates: N. 1534850.57 E. 405943.64	Ground Elevation: 766.7
Date Well Installed: Unknown	Installed Well Depth (TOC): 18.47'
Date Well Developed: 8/29/95	Screened Interval (TOC): 7.77' to 18.47'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Stainless Steel

DEVELOPMENT DATA

<input type="checkbox"/> Initial Development <input checked="" type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: <u>12.14</u> ft Time: <u>0800</u> Final: <u>12.22</u> ft Time: <u>0925</u>		Sounded Depth (TOC): Initial: <u>18.14</u> ft Time: <u>0802</u> Final: <u>18.24</u> ft Time: <u>0927</u>
Development Start: Date: <u>8/29/95</u> Time: <u>0810</u>		Development Finish: Date: <u>8/29/95</u> Time: <u>0930</u>
Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____		

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.25 gpm.

Misc. Notes:

Submerged Volume Calculation:

18.1 ft - 12.1 ft = 6.0 ft * 0.16 gal/ft = 0.96 gal

One Submerged Volume: 0.96 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
0830	0.25	1.0	6.71	17.5	193.9	-3.8			
0834	0.25	2.0	6.86	16.0	89.1	-12.6			
0838	0.25	3.0	7.01	15.9	51.5	-18.7			
0842	0.25	4.0	7.11	15.9	31.8	-23.4			
0846	0.25	5.0	7.17	15.7	21.2	-26.2			
0850	0.25	6.0	7.23	15.8	14.6	-28.7			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/29/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT102A

Location: Elkhart, IN

TOC Elevation: 769.09

DEVELOPMENT DATA (CONT.)

Misc. Notes:

[illegible]

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: Z. Anne Chapman Shuck Date: 8/29/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT102B
Location: Elkhart, IN	TOC Elevation: 768.82
Well Coordinates: N. 1534872.79 E. 405939.79	Ground Elevation: 766.4
Date Well Installed: 12/2/90	Installed Well Depth (TOC): 67.91'
Date Well Developed: 8/28/95	Screened Interval (TOC): 62.91' to 67.91'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Stainless Steel

DEVELOPMENT DATA

<input type="checkbox"/> Initial Development <input checked="" type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: 11.77 ft Time: 1430 Final: 11.8 ft Time: 1542	Sounded Depth (TOC): Initial: 67.34 ft Time: 1432 Final: 67.44 ft Time: 1544	Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____
Development Start: " Date: 8/28/95 Time: 1450	Development Finish: Date: 8/28/95 Time: 1540	

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 1.0 gpm.

Misc. Notes:

Submerged Volume Calculation:
 67.3 ft - 11.8 ft = 55.5 ft * 0.16 gal/ft = 8.9 gal

One Submerged Volume: 8.9 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1504	1.0	4.0	7.07	17.3	24.40	-18.0			
1508	1.0	8.0	7.21	13.9	8.20	-27.9			
1512	1.0	12.0	7.33	13.7	11.55	-32.1			
1516	1.0	16.0	7.45	14.0	9.20	-37.5			
1520	1.0	20.0	7.51	13.2	2.25	-40.4			
1524	1.0	24.0	7.56	14.0	5.25	-44.3			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/28/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT102B

Location: Elkhart, IN

TOC Elevation: 768.82

DEVELOPMENT DATA (CONT.)

Misc. Notes:

[illegible]

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature:

Signature: Ringene Carolyn Edwards

Date: 8/28/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT111A
Location: Elkhart, IN	TOC Elevation: 766.45
Well Coordinates: N. 1531905.43 E. 406358.78	Ground Elevation: 764.4
Date Well Installed: 9/10/91	Installed Well Depth (TOC): 22.0'
Date Well Developed: 8/25/95	Screened Interval (TOC): 11.3' to 22.0'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input type="checkbox"/> Initial Development <input checked="" type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's	
Static Water Level (TOC): Initial: 13.50 ft Time: 0815 Final: 13.53 ft Time: 0931		Sounded Depth (TOC): Initial: 21.74 ft Time: 0817 Final: 21.84 ft Time: 0933	
Development Start: Date: 8/25/95 Time: 0830		Development Finish: Date: 8/25/95 Time: 0935	
Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
*Measured Sediment Thickness in Jar: _____			

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 1.25 gpm.

Misc. Notes:

Submerged Volume Calculation:

21.7 ft - 13.5 ft = 8.2 ft * 0.16 gal/ft = 1.3 gal

One Submerged Volume: 1.3 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
0841	1.25	1.3	5.72	14.5	>200	+55.9			
0845	1.25	2.6	5.86	15.1	161.5	+47.7			
0849	1.25	3.9	5.98	15.2	102.5	+40.7			
0853	1.25	5.2	5.93	13.9	79.0	+44.0			
0857	1.25	6.5	5.94	14.8	63.0	+43.0			
0901	1.25	7.8	5.92	14.5	49.9	+43.7			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen, Carolyn Schwafel*

Date: 8/25/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT111A

Location: Elkhart, IN

TOC Elevation: 766.45

DEVELOPMENT DATA (CONT.)

Misc. Notes:

[illegible]

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature:

Signature: E. O. Richardson Date: 8/25/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT112A
Location: Elkhart, IN	TOC Elevation: 765.90
Well Coordinates: N. 1533653.49 E. 406824.67	Ground Elevation: 763.6
Date Well Installed: 8/23/95 to 8/24/95	Installed Well Depth (TOC): 17.9'
Date Well Developed: 8/26/95	Screened Interval (TOC): 7.7' to 17.7'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Warm, 80's, sunny
Static Water Level (TOC): Initial: <u>11.24</u> feet Time: <u>1230</u> Final: <u>11.40</u> feet Time: <u>1436</u>		Sounded Depth (TOC): Initial: <u>17.84</u> ft Time: <u>1232</u> Final: <u>18.09</u> ft Time: <u>1438</u>
Development Start: Date: <u>8/26/95</u> Time: <u>1230</u>		
Development Finish: Date: <u>8/26/95</u> Time: <u>1436</u>		Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.25 gpm.

Misc. Notes:

Submerged Volume Calculation:
 17.8 ft - 11.24 ft = 6.6 ft * 0.16 gal/min = 1.0 gal

One Submerged Volume: 1.0 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1324	0.25	1.0	6.65	17.7	>200	-12.5			
1328	0.25	2.0	6.94	17.2	125.6	-28.5			
1332	0.25	3.0	7.02	17.0	77.4	-32.4			
1336	0.25	4.0	7.16	17.0	54.9	-40.6			
1340	0.25	5.0	7.25	17.2	31.7	-45.0			
1344	0.25	6.0	7.30	17.2	51.0	-48.3			

Name: Tim Jensen and Michelle Benak

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Michelle Benak*

Date: 8/26/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT112A

Location: Elkhart, IN

TOC Elevation: 765.90

DEVELOPMENT DATA (CONT.)

Misc. Notes:

[illegible]

Name: Tim Jensen and Michelle Benak

Firm: US Army Corps of Engineers

Signature: Michelle Remy 1/7/17

Date: 8/26/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT112B
Location: Elkhart, IN	TOC Elevation: 766.09
Well Coordinates: N. 1533653.01 E. 406834.06	Ground Elevation: 763.4
Date Well Installed: 8/23/95 to 8/24/95	Installed Well Depth (TOC): 62.3'
Date Well Developed: 8/28/95	Screened Interval (TOC): 57.1' to 62.1'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Warm, sunny
Static Water Level (TOC): Initial: <u>11.53 feet</u> Time: <u>0825</u> Final: <u>11.66 feet</u> Time: <u>0934</u>		Sounded Depth (TOC): Initial: <u>61.04 ft</u> Time: <u>0828</u> Final: <u>62.34 ft</u> Time: <u>0936</u> Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____
Development Start: Date: <u>8/28/95</u> Time: <u>0850</u>		
Development Finish: Date: <u>8/28/95</u> Time: <u>0940</u>		

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.25 gpm.

Misc. Notes:

Submerged Volume Calculation:
 $61.0 \text{ ft} - 11.5 \text{ ft} = 49.5 \text{ ft} * 0.16 \text{ gal/ft} = 7.9 = 8.0 \text{ gal}$

One Submerged Volume: 8.0 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
0904	0.25	8.0	6.98	14.7	187.30	-22.8			
0908	0.25	16.0	7.20	12.7	27.30	-33.4			
0912	0.25	24.0	7.29	12.4	9.38	-39.9			
0916	0.25	32.0	7.42	12.2	5.77	-46.6			
0920	0.25	40.0	7.54	12.0	3.33	-51.9			
0924	0.25	48.0	7.72	12.6	2.65	-59.2			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/28/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT112B

Location: Elkhart, IN

TOC Elevation: 766.09

DEVELOPMENT DATA (CONT.)

Misc. Notes:

[illegible]

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *[Handwritten Signature]*

Date: 8/28/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT113A
Location: Elkhart, IN	TOC Elevation: 771.85
Well Coordinates: N. 1533608.69 E. 407789.11	Ground Elevation: 769.2
Date Well Installed: 8/10/95 to 8/11/95	Installed Well Depth (TOC): 24.6'
Date Well Developed: 8/22/95	Screened Interval (TOC): 14.4' to 24.4'
Fluid Losses During Drilling: Unknown	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Warm, Sunny 90's	
Static Water Level (TOC): Initial: <u>18.19</u> feet Time: <u>0812</u> Final: _____ Time: _____		Sounded Depth (TOC): Initial: <u>24.54</u> ft Time: <u>0815</u> Final: _____ Time: _____	
Development Start: Date: <u>8/22/95</u> Time: <u>0848</u>		Development Finish: Date: <u>8/22/95</u> Time: <u>0950</u>	
Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____			

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.5 gpm.

Misc. Notes:

Submerged Volume Calculation:

24.5 ft - 18.2 ft = 6.3 ft * 0.16 gal/ft = 1.0 gal

One Submerged Volume: 1.0 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
0916	0.5	0	7.38	18.5	>200	-36.5			
0920	0.5	2	7.47	16.2	>200	-40.8			
0924	0.5	4	7.51	16.0	90.0	-38.9			
0928	0.5	6	7.65	15.8	69.5	-49.5			
0932	0.5	8	7.78	15.7	49.0	-56.2			
0936	0.5	10	7.81	15.7	34.5	-58.7			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/22/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT113A

Location: Elkhart, IN

TOC Elevation: 771.85

DEVELOPMENT DATA (CONT.)

Misc. Notes:

[illegible]

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: Kimberly Carolyn Edwards

Date: 8/22/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT113B
Location: Elkhart, IN	TOC Elevation: 772.06
Well Coordinates: N. 1533604.43 E. 407779.02	Ground Elevation: 769.3
Date Well Installed: 8/10/95 to 8/11/95	Installed Well Depth (TOC): 70.2'
Date Well Developed: 8/21/95	Screened Interval (TOC): 65.0' to 70.0'
Fluid Losses During Drilling: Unknown	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: <u>18.38 feet</u> Time: <u>0855</u> Final: <u>18.42 feet</u> Time: <u>1600</u>	Sounded Depth (TOC): Initial: <u>70.44 ft</u> Time: <u>0858</u> Final: <u>70.44 ft</u> Time: <u>1602</u>	Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Development Start: Date: <u>8/21/95</u> Time: <u>1010</u>	Development Finish: Date: <u>8/21/95</u> Time: <u>1558</u>	*Measured Sediment Thickness in Jar: _____

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 1.5 gpm.

Misc. Notes:
 Turbidity meter not working due to battery failure.

Submerged Volume Calculation:
 $70.4 \text{ ft} - 18.4 \text{ ft} = 52.0 \text{ ft} * 0.16 \text{ gal/ft} = 8.3 \text{ gal}$

One Submerged Volume: 8.3 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1010	1.5	0	>7.0	-----	-----	-----			Recalibrated Instrument
1018	1.5	10	7.54	16.4	N/A	-32.2			Gray due to sediment
1020	-----	-----	-----	-----	-----	-----			Ceased pumping
1452	-----	-----	-----	-----	-----	-----			Resumed pumping
1510	1.5	20	7.44	16.6	N/A	-36.4			
1516	1.5	30	7.33	13.8	N/A	-30.7			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: 

Date: 8/21/95

Page 1 **of** 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT113B

Location: Elkhart, IN

TOC Elevation: 772.06

DEVELOPMENT DATA (CONT.)

Misc. Notes:

Turbidity meter not working due to battery failure

[illegible]

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: Timothy Coleman Shurp

Date: 8/21/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT114A
Location: Elkhart, IN	TOC Elevation: 769.19
Well Coordinates: N. 1531843.97 E. 407997.29	Ground Elevation: 766.7
Date Well Installed: 8/21/95 to 8/22/95	Installed Well Depth (TOC): 24.7'
Date Well Developed: 8/26/95	Screened Interval (TOC): 14.5' to 24.5'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: <u>17.55</u> feet Time: <u>0725</u> Final: <u>17.66</u> feet Time: <u>0905</u>		Sounded Depth (TOC): Initial: <u>24.84</u> ft Time: <u>0727</u> Final: <u>24.39</u> ft Time: <u>0905</u>
Development Start: Date: <u>8/26/95</u> Time: <u>0800</u>		
Development Finish: Date: <u>8/26/95</u> Time: <u>0900</u>		Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.3 gpm.

Misc. Notes:

Submerged Volume Calculation:

24.8 ft - 17.6 ft = 7.2 ft * 0.16 gal/ft = 1.1 gal

One Submerged

Volume: 1.1 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
0804	0.3	1.1	6.97	15.3	>200	-18.2			
0808	0.3	2.2	6.95	14.8	>200	-20.0			
0812	0.3	3.3	-----	-----	-----	-----			No sample taken
0816	0.3	4.4	6.97	14.2	>200	-20.6			
0820	0.3	5.5	6.85	14.7	112.4	-15.1			
0824	0.3	6.6	7.01	14.2	>200	-23.4			

Name: Tim Jensen and Michelle Benak

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Michelle Benak*

Date: 8/26/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT114A

Location: Elkhart, IN

TOC Elevation: 769.19

DEVELOPMENT DATA (CONT.)									
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Misc. Notes:

[illegible]

Name: Tim Jensen and Michelle Benak

Firm: US Army Corps of Engineers

Signature: Michelle Bernick / Rine

Date: 8/26/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT114B
Location: Elkhart, IN	TOC Elevation: 769.37
Well Coordinates: N. 1531834.38 E. 407995.71	Ground Elevation: 766.9
Date Well Installed: 8/22/95 to 8/23/95	Installed Well Depth (TOC): 68.0'
Date Well Developed: 8/26/95	Screened Interval (TOC): 62.8' to 67.8'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: <u>17.63 feet</u> Time: <u>0912</u> Final: <u>17.90 feet</u> Time: <u>1123</u>		Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____
Sounded Depth (TOC): Initial: <u>67.84 ft</u> Time: <u>0915</u> Final: <u>68.12 ft</u> Time: <u>1125</u>		
Development Start: Date: <u>8/26/95</u> Time: <u>0910</u>		Development Finish: Date: <u>8/26/95</u> Time: <u>1127</u>

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 2.0 gpm.

Misc. Notes:

Submerged Volume Calculation:
 $67.8 \text{ ft} - 17.6 \text{ ft} = 50.2 \text{ ft} * 0.16 \text{ gal/ft} = 8.0 \text{ gal}$

One Submerged Volume: 8.0 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1038	2.0	8.0	6.58	15.4	16.3	-2.9			
1042	2.0	16.0	6.80	15.2	11.5	-10.8			
1046	2.0	24.0	6.96	17.9	26.2	-22.0			
1050	2.0	32.0	6.95	15.2	14.1	-19.1			
1054	2.0	40.0	6.99	14.2	3.9	-20.0			
1058	2.0	48.0	6.85	14.9	7.4	-13.6			

Name: Tim Jensen and Michelle Benak

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Michelle Benak*

Date: 8/26/95

Page 1 of 1

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT115A
Location: Elkhart, IN	TOC Elevation: 765.87
Well Coordinates: N. 1531675.84 E. 407261.44	Ground Elevation: 763.6
Date Well Installed: 8/22/95 to 8/23/95	Installed Well Depth (TOC): 19.9'
Date Well Developed: 8/24/95	Screened Interval (TOC): 9.7' to 19.7'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm	
Static Water Level (TOC): Initial: <u>13.8 ft</u> Time: <u>1330</u> Final: _____ Time: _____		Sounded Depth (TOC): Initial: <u>19.74 ft</u> Time: <u>1332</u> Final: _____ Time: _____	
Development Start: Date: <u>8/24/95</u> Time: <u>1335</u>		Development Finish: Date: <u>8/24/95</u> Time: <u>1700</u>	
Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
*Measured Sediment Thickness in Jar: _____			

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.25 gpm.

Misc. Notes:

Submerged Volume Calculation:

19.7 ft - 13.8 ft = 5.9 ft * 0.16 gal/ft = 0.9 = 1.0 gal

One Submerged Volume: 1.0 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1353	0.25	1.0	7.44	17.7	>200	-35.8			
1357	0.25	2.0	7.41	17.1	>200	-34.9			
1401	0.25	3.0	7.46	20.3	>200	-38.9			pumped dry after 3 well
1405	0	-----	-----	-----	-----	-----			volumes, allowed to recover
1434	0.25	4.0	7.96	19.8	>200	-60.5			
1438	0.25	5.0	7.81	16.8	>200	-54.3			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/24/95

Page 1 of 3

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT115A

Location: Elkhart, IN

TOC Elevation: 765.87

DEVELOPMENT DATA (CONT.)

Misc. Notes:

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1442	0.25	6.0	7.73	17.0	>200	-50.4			
1446	0.25	7.0	7.66	16.9	>200	-46.6			
1450	0.25	8.0	7.55	16.9	>200	-41.9			
1454	0.25	9.0	7.53	15.9	>200	-40.3			
1458	0.25	10.0	7.50	16.4	>200	-39.2			
1502	0.25	11.0	7.53	16.3	>200	-40.1			
1506	0.25	12.0	7.50	16.0	>200	-39.5			
1510	0.25	13.0	7.49	15.6	>200	-38.8			
1514	0.25	14.0	7.51	15.9	>200	-39.9			
1518	0.25	15.0	7.51	16.0	>200	-39.8			
1522	0.25	16.0	7.56	15.0	>200	-41.9			
1526	0.25	17.0	7.61	14.7	>200	-44.6			
1530	0.25	18.0	7.52	15.0	>200	-41.0			
1534	0.25	19.0	7.54	14.6	>200	-41.5			
1538	0.25	20.0	7.59	14.6	>200	-43.6			
1542	0.25	21.0	7.62	14.7	>200	-45.1			
1546	0.25	22.0	7.65	14.5	>200	-46.6			
1550	0.25	23.0	7.67	14.6	>200	-47.2			
1554	0.25	24.0	7.52	14.9	>200	-40.7			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature:

Tim Jensen Carolyn Schwafel

Date: 8/24/95

Page 2 **of** 3

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT115A

Location: Elkhart, IN

TOC Elevation: 765.87

DEVELOPMENT DATA (CONT.)

Misc. Notes:

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1558	0.25	25.0	7.56	14.8	>200	-42.8			
1602	0.25	26.0	7.61	15.0	>200	-44.6			
1606	0.25	27.0	7.61	14.8	>200	-44.4			
1610	0.25	28.0	7.60	15.1	163.2	-44.5			
1614	0.25	29.0	7.57	15.1	169.9	-42.7			
1618	0.25	30.0	7.61	14.8	135.7	-44.6			
1622	0.25	31.0	7.65	15.1	111.2	-46.6			
1626	0.25	32.0	7.69	14.9	136.5	-48.6			
1630	0.25	33.0	7.68	15.0	130.5	-47.5			
1634	0.25	34.0	7.68	14.7	182.8	-47.5			
1638	0.25	35.0	7.69	14.4	166.7	-47.6			
1642	0.25	36.0	7.69	14.2	161.5	-48.1			
1646	0.25	37.0	7.71	14.2	144.7	-49.3			
1650	0.25	38.0	7.70	14.5	145.1	-48.7			
1654	0.25	39.0	7.69	14.4	125.5	-48.2			
1658	0.25	40.0	7.67	14.8	166.1	-47.5			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/24/95

Page 3 of 3

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT116A
Location: Elkhart, IN	TOC Elevation: 763.86
Well Coordinates: N. 1531925.50 E. 406784.96	Ground Elevation: 761.7
Date Well Installed: 8/17/95 to 8/18/95	Installed Well Depth (TOC): 15.0'
Date Well Developed: 8/23/95	Screened Interval (TOC): 4.8' to 14.8'
Fluid Losses During Drilling: N/A	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, 90's
Static Water Level (TOC): Initial: <u>6.03</u> feet Time: <u>1000</u> Final: _____ Time: _____		Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____
Sounded Depth (TOC): Initial: <u>16.9</u> Time: <u>1002</u> Final: _____ Time: _____		
Development Start: Date: <u>8/23/95</u> Time: <u>1015</u>		Development Finish: Date: <u>8/23/95</u> Time: <u>1240</u>

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.7 gpm.

Misc. Notes:

Submerged Volume Calculation:
 16.9 ft - 6.0 ft = 10.9 ft * 0.16 gal/ft = 1.74 gal

One Submerged Volume: 1.74 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1020	0.7	0.7	7.20	22.7	>200	-23.4			odor of H2S gas, black
1024	0.7	1.4	7.33	20.2	>200	-32.7			rotten eggs odor
1028	0.7	2.1	7.18	21.5	>200	-24.2			adjust pumping rate
	0.05	-----	----	-----	-----	-----			leave pumping during lunch
1218	0.05	2.8	6.84	29.8	>200	-6.0			
1228	0.05	3.15	6.72	30.7	92.1	+2.0			

Name: Tim Jensen and Carolyn Schwafel	Firm: US Army Corps of Engineers
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Signature: <i>Tim Jensen / Carolyn Schwafel</i>	Date: 8/23/95	Page <u>1</u> of <u>2</u>
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USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT116A

Location: Elkhart, IN

TOC Elevation: 763.86

DEVELOPMENT DATA (CONT.)

Misc. Notes:

It will not be possible to develop well much more due to the long cycle time and relatively long residence time in hose bundle. Water in the hose bundle warms up between cycles because on 10 feet of the 50 feet of hose in bundle is below ground. Cycles are set at 10 minute intervals to allow well to recover as it is being pumped.

[illegible]

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: Zin Oun / Carolyn Schuchel

Date: 8/23/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT116B
Location: Elkhart, IN	TOC Elevation: 763.89
Well Coordinates: N. 1531931.04 E. 406775.79	Ground Elevation: 761.9
Date Well Installed: 8/17/95 to 8/18/95	Installed Well Depth (TOC): 60.6'
Date Well Developed: 8/23/95	Screened Interval (TOC): 55.4' to 60.4'
Fluid Losses During Drilling: Unknown	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's	
Static Water Level (TOC): Initial: <u>11.02 ft</u> Time: <u>0740</u> Final: <u>11.02 ft</u> Time: <u>0900</u>		Sounded Depth (TOC): Initial: <u>60.64 ft</u> Time: <u>0742</u> Final: <u>60.84 ft</u> Time: <u>0900</u>	
Development Start: Date: <u>8/23/95</u> Time: <u>0800</u>		Development Finish: Date: <u>8/23/95</u> Time: <u>0853</u>	
Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____			

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 2.0 gpm.

Misc. Notes:

Submerged Volume Calculation:
 60.6 ft - 11.0 ft = 49.6 ft * 0.16 gal/ft = 7.94 = 8.0 gal

One Submerged Volume: 8.0 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
0841	2.0	8.0	7.56	13.1	39.4	-43.7			
0845	2.0	16.0	7.56	12.3	53.9	-43.7			
0849	2.0	24.0	7.58	12.3	14.9	-45.0			
0853	2.0	32.0	7.52	12.3	12.3	-42.3			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/23/95

Page 1 of 1

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT117A
Location: Elkhart, IN	TOC Elevation: 767.19
Well Coordinates: N. 1532201.98 E. 405908.93	Ground Elevation: 764.8
Date Well Installed: 8/15/95 to 8/17/95	Installed Well Depth (TOC): 18.1'
Date Well Developed: 8/22/95	Screened Interval (TOC): 7.9' to 17.9'
Fluid Losses During Drilling: Unknown	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's
Static Water Level (TOC): Initial: 13.79 ft Time: 1032 Final: _____ Time: _____	Sounded Depth (TOC): Initial: 18.24 ft Time: 1034 Final: _____ Time: _____	Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____
Development Start: Date: 8/22/95 Time: 1040	Development Finish: Date: 8/22/95 Time: 1425	

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 0.7 gpm.

Misc. Notes:

Submerged Volume Calculation:

$$18.2 \text{ ft} - 13.8 \text{ ft} = 4.4 \text{ ft} * 0.16 \text{ gal/ft} = 0.7 \text{ gal}$$

One Submerged Volume: 0.7 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1102	0.7	2.8	7.23	22.1	>200	-23.3			
1106	0.7	5.6	7.45	19.8	>200	-37.7			
1110	0.7	8.4	7.57	19.6	>200	-42.0			
1114	0.7	11.2	7.63	19.4	>200	-44.2			
1118	0.7	14.0	7.68	19.6	>200	-49.0			
1122	0.7	16.8	7.72	19.4	>200	-50.4			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/22/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT117A

Location: Elkhart, IN

TOC Elevation: 767.19

DEVELOPMENT DATA (CONT.)

Misc. Notes:

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1126	0.7	19.6	7.76	20.0	>200	-52.0			
1130	0.7	22.4	7.75	19.9	>200	-52.7			lift pump to accomodate 0.35
1134	0.35	23.8	7.80	20.4	>200	-54.7			gpm rate after 32 well vols.
1138	0.35	25.2	7.86	21.6	>200	-57.5			
1142	0.35	26.6	7.86	20.7	>200	-57.2			
1146	0.35	28.0	7.86	20.8	>200	-58.2			
1150	0.35	29.4	7.85	21.1	>200	-56.8			
1154	0.35	30.8	7.83	21.3	>200	-56.9			
1158	0.35	32.2	7.87	21.3	>200	-57.9			ceased pumping at 1158
1301	0.35	33.6	7.32	27.9	>200	-31.2			resumed at 1258
1305	0.35	35.0	7.54	21.7	>200	-41.9			
1309	0.35	36.4	7.61	20.5	>200	-43.6			
1413	0.35	37.8	7.63	20.1	>200	-44.5			
1417	0.35	39.2	7.66	20.0	>200	-46.6			
1421	0.35	40.6	7.67	19.6	>200	-47.3			ceased pumping can not get
									turbidity to decrease

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature:

Tim Jensen Carolyn Schwafel

Date: 8/22/95

Page 2 **of** 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT117B
Location: Elkhart, IN	TOC Elevation: 766.6
Well Coordinates: N. 1532202.51 E. 405896.41	Ground Elevation: 764.4
Date Well Installed: 8/14/95 to 8/17/95	Installed Well Depth (TOC): 63.7'
Date Well Developed: 8/22/95	Screened Interval (TOC): 58.5' to 63.5'
Fluid Losses During Drilling: Unknown	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's	
Static Water Level (TOC): Initial: <u>13.21 ft</u> Time: <u>1425</u> Final: <u>13.21 ft</u> Time: <u>1511</u>		Sounded Depth (TOC): Initial: <u>63.74 ft</u> Time: <u>1426</u> Final: <u>63.74 ft</u> Time: <u>1511</u>	
Development Start: ** Date: <u>8/22/95</u> Time: <u>1428</u>		Development Finish: Date: <u>8/22/95</u> Time: <u>1455</u>	
Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____			

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 2.0 gpm.

Misc. Notes:

Submerged Volume Calculation:
 63.7 ft - 13.2 ft = 50.5 ft * 0.16 gal/ft = 8.1 gal

One Submerged Volume: 8.1 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1431	2.0	8.0	7.85	15.8	38.1	-57.3			
1435	2.0	16.0	7.86	14.7	13.2	-57.0			
1439	2.0	24.0	7.93	13.9	130.6	-60.0			
1443	2.0	32.0	7.73	14.1	13.2	-50.5			
1447	2.0	40.0	7.71	13.8	5.5	-47.7			
1451	2.0	48.0	7.65	14.2	3.8	-46.1			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/22/95

Page 1 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site

Well Number: WT117B

Location: Elkhart, IN

TOC Elevation: 766.6

DEVELOPMENT DATA (CONT.)

Misc. Notes:

[illegible]

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature:

Signature: Zi Yan (Carolyn Chung) Date: 8/22/95

Page 2 of 2

USACE WELL DEVELOPMENT RECORD

SITE & WELL DATA

Project: Himco Dump Superfund Site	Well Number: WT118B
Location: Elkhart, IN	TOC Elevation: 766.49
Well Coordinates: N. 1531917.55 E. 406361.16	Ground Elevation: 764.1
Date Well Installed: 8/18/95 to 8/21/95	Installed Well Depth (TOC): 65.1'
Date Well Developed: 8/23/95	Screened Interval (TOC): 59.9' to 64.9'
Fluid Losses During Drilling: Unknown	Casing Diameter: 2.0" Schedule 40 PVC

DEVELOPMENT DATA

<input checked="" type="checkbox"/> Initial Development <input type="checkbox"/> Redevelopment		Weather Conditions: Sunny, warm, 90's	
Static Water Level (TOC): Initial: <u>13.57 ft</u> Time: <u>1410</u> Final: <u>13.60 ft</u> Time: <u>1512</u>		Sounded Depth (TOC): Initial: <u>65.24 ft</u> Time: <u>1412</u> Final: <u>65.24 ft</u> Time: <u>1510</u>	
Development Start: , Date: <u>8/23/95</u> Time: <u>1410</u>		Development Finish: Date: <u>8/23/95</u> Time: <u>1510</u>	
Post Development Water: Jar Photographed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No *Measured Sediment Thickness in Jar: _____			

Development Method (Completely describe development method to include all equipment and procedures):
 Surged and pumped well with Well Wizard at 2.0 gpm.

Misc. Notes:

Submerged Volume Calculation:
 $65.2 \text{ ft} - 13.6 \text{ ft} = 51.6 \text{ ft} * 0.16 \text{ gal/ft} = 8.3 \text{ gal}$

One Submerged Volume: 8.3 gal

Time	Pump Rate (gpm)	Volume Removed (gal)	pH	Temp. (°C)	Turb. (ntu)	Cond. (mV)	D.O. ()	Eh ()	Remarks (Color, odor, etc.)
1413	2.0	8.2	6.98	15.7	92.1	-28.1			
1417	2.0	16.4	6.96	14.9	94.2	-27.3			
1421	2.0	24.6	6.96	22.0	104.1	-24.9			
1425	2.0	32.8	7.13	22.9	144.8	-36.1			
1429	2.0	41.0	6.90	23.2	127.0	-22.7			
1433	2.0	49.2	6.99	23.4	140.8	-29.2			

Name: Tim Jensen and Carolyn Schwafel

Firm: US Army Corps of Engineers

Signature: *Tim Jensen Carolyn Schwafel*

Date: 8/23/95

Page 1 of 2

APPENDIX F:
MONITORING WELL GAUGING FORMS

WELL GAUGING FORM

INSPECTOR(S): Rhiner, Schneider, Benak

SITE: Himco Dump Superfund Site WELL NUMBER: WTB1

DATE: 9/16/95 TIME: 1155

SWL (TOC): 8.86' 8.85' BOTTOM: TIME: 1158

SWL (TOC): 8.85' 8.86' BOTTOM: *BOH too deep TIME: 1245

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY RECOMMENDATIONS:

* Looked at records of the well and it was listed at 473' below ground surface. Tape that was used for the wells was only 200' long.

5" diameter well

HNu: 1.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Rhiner, Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WTB2

DATE: 9/16/95

TIME: 1155

SWL (TOC): 8.31' 8.41'

BOTTOM: TIME: 1202

SWL (TOC): 8.43' 8.43'

BOTTOM: 13.14' TIME: 1254

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

Debris came up on the probe after measuring the bottom. Looks like
roots.

2" diameter well

HNu: 2.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Rhiner, Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WTB3

DATE: 9/16/95

TIME: 1156

SWL (TOC): 8.47' 8.46'

BOTTOM: _____ TIME: 1205

SWL (TOC): 8.48' 8.47'

BOTTOM: 123.81' TIME: 1301

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

5" diameter well

HNu: 0.0

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Rhiner, Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WTB4

DATE: 9/16/95

TIME: 1156

SWL (TOC): 7.58' 7.57'

BOTTOM: _____ TIME: 1208

SWL (TOC): 7.49' 7.52'

BOTTOM: 173.83' TIME: 1310

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

Debris floating on top of the water. Looks like plants.

5" diameter well

HNu: 0.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WTE1

DATE: 9/16/95

TIME: 1627

SWL (TOC): 14.16' 14.13'

BOTTOM: _____ TIME: 1635

SWL (TOC): 14.11' 14.15'

BOTTOM: 81.14' TIME: 1726

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

No concrete pad

5" diameter well

HNu: 0.0

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WTE3

DATE: 9/16/95

TIME: 1627

SWL (TOC): 13.79' 13.80'

BOTTOM: _____ TIME: 1638

SWL (TOC): 13.80' 13.79'

BOTTOM: 175.34' TIME: 1726

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

No concrete pad

5" diameter well

HNu: 0.0

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT01

DATE: 9/16/95

TIME: 1240

SWL (TOC): 11.57' 11.62'

BOTTOM: _____ TIME: 1249

SWL (TOC): 11.56' 11.63'

BOTTOM: 29.24'/29.39' TIME: 1602

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY RECOMMENDATIONS:

Flushmount well with 12" manhole cover marked "water meter"

2" diameter well

HNu: 0.8

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson, Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT101A

DATE: 9/16/95

TIME: 1008

SWL (TOC): 12.77' 12.91'

BOTTOM: _____ TIME: 1008

SWL (TOC): 12.76' 12.85'

BOTTOM: 18.64'/19.03' TIME: 1648

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 1.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Schneider

SITE: Himco Dump Superfund Site

WELL NUMBER: WT101B

DATE: 9/16/95

TIME: 1040

SWL (TOC): 12.77' 12.77'

BOTTOM: _____ TIME: 1040

SWL (TOC): 12.76' 12.82'

BOTTOM: 101.14'/101.04' TIME: 1700

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

No concrete pad

2" diameter well

HNu: 1.0

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Schneider

SITE: Himco Dump Superfund Site

WELL NUMBER: WT101C

DATE: 9/16/95

TIME: 1045

SWL (TOC): 12.42' 12.43'

BOTTOM: _____ TIME: 1045

SWL (TOC): 12.44' 12.45'

BOTTOM: 168.14'/168.89' TIME: 1709

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

No concrete pad

2" diameter well

HNu: 1.0

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT102A

DATE: 9/16/95

TIME: 1110

SWL (TOC): 12.55' 12.56'

BOTTOM: _____ TIME: 1136

SWL (TOC): 12.55' 12.60'

BOTTOM: 18.16'/18.22' TIME: 1455

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

No concrete pad

2" diameter well

HNu: 1.4

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT102B

DATE: 9/16/95

TIME: 1110

SWL (TOC): 12.21' 12.24'

BOTTOM: _____ TIME: 1125

SWL (TOC): 12.21' 12.22'

BOTTOM: 67.64'/67.49' TIME: 1440

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

No concrete pad

2" diameter well

HNu: 1.8

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT102C

DATE: 9/16/95

TIME: 1110

SWL (TOC): 12.7' 12.71'

BOTTOM: _____ TIME: 1131

SWL (TOC): 12.7' 12.71'

BOTTOM: 160.14' TIME: 1500

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

No concrete pad

2" diameter well

HNu: 1.6

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT103A

DATE: 9/16/95

TIME: 1556

SWL (TOC): 7.29' 7.30'

BOTTOM: _____ TIME: 1604

SWL (TOC): 7.34' 7.34'

BOTTOM: 18.50' TIME: 1702

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site WELL NUMBER: WT104A

DATE: 9/23/95 TIME: 1419

SWL (TOC): 13.72' BOTTOM: 18.86' TIME: 1439

SWL (TOC): _____ BOTTOM: _____ TIME: _____

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.4
O₂: 20.8%
LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT105A

DATE: 9/16/95

TIME: 1628

SWL (TOC): 11.62' 11.60'

BOTTOM: _____ TIME: 1648

SWL (TOC): 11.62'

BOTTOM: 18.61' TIME: 1722

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT106A

DATE: 9/16/95

TIME: 1614

SWL (TOC): 10.69' 10.68'

BOTTOM: _____ TIME: 1620

SWL (TOC): 10.69' 10.68'

BOTTOM: 18.54' TIME: 1712

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.0

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT111A

DATE: 9/16/95

TIME: 1449

SWL (TOC): 14.21' 14.10'

BOTTOM: _____ TIME: 1501

SWL (TOC): 14.22' 14.19'

BOTTOM: 21.80' TIME: 1533

MEASURE POINT MARKED: Yes

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.0

O₂: 20.8%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT112A

DATE: 9/16/95

TIME: 1155

SWL (TOC): 11.72' 11.73'

BOTTOM: _____ TIME: 1207

SWL (TOC): 11.73' 11.72'

BOTTOM: 17.84'/18.05' TIME: 1524

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY RECOMMENDATIONS:

2" diameter well

HNu: 1.2

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT112B

DATE: 9/16/95

TIME: 1155

SWL (TOC): 11.93' 11.94'

BOTTOM: _____ TIME: 1204

SWL (TOC): 11.94' 11.94'

BOTTOM: 62.44'/62.44' TIME: 1530

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 1.4

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT113A

DATE: 9/16/95

TIME: 1217

SWL (TOC): 18.71' 18.73'

BOTTOM: _____ TIME: 1226

SWL (TOC): 18.7' 18.73'

BOTTOM: 24.69'/24.69' TIME: 1544

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 1.6

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT113B

DATE: 9/16/95

TIME: 1217

SWL (TOC): 18.93' 18.95'

BOTTOM: _____ TIME: 1229

SWL (TOC): 18.93' 18.94'

BOTTOM: 70.14'/70.14' TIME: 1548

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 1.6

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT114A

DATE: 9/16/95

TIME: 1300

SWL (TOC): 17.98' 17.99'

BOTTOM: _____ TIME: 1310

SWL (TOC): 18.01' 18.02'

BOTTOM: 24.74'/24.79' TIME: 1615

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 1.0

O₂: 20.8%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT114B

DATE: 9/16/95

TIME: 1310

SWL (TOC): 18.03' 18.05'

BOTTOM: _____ TIME: 1314

SWL (TOC): 18.05' 18.05'

BOTTOM: 68.04'/67.74' TIME: 1620

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 1.2-2.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schwafel, Pearson

SITE: Himco Dump Superfund Site

WELL NUMBER: WT115A

DATE: 9/16/95

TIME: 1328

SWL (TOC): 14.35' 14.35'

BOTTOM: _____ TIME: 1336

SWL (TOC): 14.35' 14.35'

BOTTOM: 19.89'/19.89' TIME: 1635

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.8

O₂: 21.0%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Rhiner, Schneider, Benak

SITE: Himco Dump Superfund Site WELL NUMBER: WT116A

DATE: 9/16/95 TIME: 1127

SWL (TOC): 10.98' 10.96' BOTTOM: _____ TIME: 1131

SWL (TOC): 10.82' 10.79' BOTTOM: 15.06' TIME: 1223

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.0
O₂: 20.9%
LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Rhiner, Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT116B

DATE: 9/16/95

TIME: 1127

SWL (TOC): 11.64' 11.64'

BOTTOM: _____ TIME: 1138

SWL (TOC): 11.60' 11.61'

BOTTOM: 60.49' TIME: 1228

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT117A

DATE: 9/16/95

TIME: 1427

SWL (TOC): 14.42' 14.42'

BOTTOM: _____ TIME: 1441

SWL (TOC): 14.45' 14.44'

BOTTOM: 18.14' TIME: 1518

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.0

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT117B

DATE: 9/16/95

TIME: 1427

SWL (TOC): 13.84' 13.84'

BOTTOM: _____ TIME: 1436

SWL (TOC): 13.85' 13.86'

BOTTOM: 63.33' TIME: 1510

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.5

O₂: 20.9%

LEL: 0%

WELL GAUGING FORM

INSPECTOR(S): Schneider, Benak

SITE: Himco Dump Superfund Site

WELL NUMBER: WT118B

DATE: 9/16/95

TIME: 1449

SWL (TOC): 14.20' 14.20'

BOTTOM: _____ TIME: 1457

SWL (TOC): 14.21' 14.20'

BOTTOM: 65.02' TIME: 1527

MEASURE POINT MARKED: No - measured from the north

WELL ID ATTACHED: No

CASING ELEVATION: N/A

WELL SECURED: Yes

INFORMATION MISSING FROM WELL ID: N/A

DESCRIBE CONDITION OF WELL, PAD, POSTS, ECT., AND ANY
RECOMMENDATIONS:

2" diameter well

HNu: 0.0

O₂: 20.8%

LEL: 0%

APPENDIX G:
MONITORING WELL SAMPLING RECORDS

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WTE1

DATE: 9/26/95

TIME: 0730

WEATHER: Cloudy 55-68° sunny in afternoon

WELL CONDITION: Existing (USGS completion) No concrete pad

WELL DEPTH (TOC): 81.24 ft. WATER LEVEL (TOC): 14.36 ft.

WELL DIAMETER: 5 in. PUMP DEPTH: 77 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 342 gallons

PURGE RATE: ~2 gpm

SAMPLERS INITIALS: SGP, CAS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1000	10	-	-	-	-	-	Purged
1028	50	11.5	7.46	975	1.35	-	10
1057	100	11.5	7.52	980	1	-	gal.
1121	150	11.6	7.61	986	1.7	-	then
1144	200	11.6	7.53	986	< 1	-	used
1208	250	11.6	7.53	986	< 1	-	flow
1233	300	11.6	7.61	986	< 1	-	cell.
1257	350	11.6	7.62	990	< 1	-	

DID WELL PUMP DRY? DESCRIBE: No. Measured water levels 14.37' at start, 14.41' after 200 gal. purged; meas. @ 1350 at 14.36'

SAMPLE TYPES: 2-40ml VOA, 4-1 liter amber/SVOA and pest/PCB, 2-1 liter poly metals/cyanide and PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 3.0/Well HNu 3.0/O₂ 20.9%/LEL 0%/20 gal. @1.45 gpm, increased flow rate up to 2.16 gpm

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT01 DATE: 9/22/95 TIME: 1016

WEATHER: Cloudy, cool 50°s

WELL CONDITION: Existing (see W.L. sheets)

WELL DEPTH (TOC): 29.34 ft. WATER LEVEL (TOC): 11.67 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 26.7 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 14.0 gallons

PURGE RATE: .25 gpm SAMPLERS INITIALS: CAS, SMS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1055	0	13.3	7.56	684	6.3	.2	
1102	1	13.8	7.52	675	5.9	0	
1107	2	13.9	7.50	675	5.7	0	
1111	3	13.9	7.49	676	5.8	0	
1115	4	13.9	7.48	675	6.0	0	
1119	5	13.9	7.47	675	5.8	0	
1122	6	14.0	7.46	679	5.5	0	
1127	7	13.9	7.45	676	5.4	0	
1132	8	13.9	7.45	679	5.4	0	
1147	9	13.9	7.44	675	5.5	0	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP
splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.2/Well HNu 0.2/O₂ 20.9%/LEL 0%

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETR	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

WATER SAMPLING CONTINUATION SHEET

PROJECT: Himco Dump Superfund Site

WELL #: WT01

DATE: 9/22/95

[illegible]

REMARKS: Sampling started at @ 1203, completed at @ 1218

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT101A

DATE: 9/25/95

TIME: 0900

WEATHER: Overcast 55°

WELL CONDITION: Existing (see W.L. sheets)

WELL DEPTH (TOC): 18.84 ft. WATER LEVEL (TOC): 13.07 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 16 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 4.5 gallons

PURGE RATE: 0.46 gpm

SAMPLERS INITIALS: SGP, CAS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1035	1	-	-	-	44	-	Purged
1038	2	14.4	7.11	1.47	8.5	6.3	1
1040	3	14.4	7.07	1.47	-	12.7	gal.
1042	4	14.7	7.07	1.49	2.75	6.2	then
1045	5	14.8	7.07	1.46	2.1	6.2	used
1048	6	14.8	7.07	1.46	2.0	6.2	flow
							cell.

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 8-40ml VOA + 12-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu .8-1.0/Well HNu 1.0/O₂ 21.1%/LEL 0%/1055 start sampling, 1125 complete sampling, sampling rate 300ml/10sec.

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT101B

DATE: 9/25/95

TIME: 1230

WEATHER: Pt. cloudy 65°

WELL CONDITION: Existing (see W.L. sheets)

WELL DEPTH (TOC): 101.14 ft. WATER LEVEL (TOC): 12.95 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 99 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 72.5 gallons

PURGE RATE: 0.91 gpm

SAMPLERS INITIALS: SGP, CAS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1325	0	-	-	-	10.5	-	Slight
1336	10	12.0	7.37	1038	1.2	7.0	odor
1347	20	12.0	7.26	1047	< 1	7.0	from
1358	30	11.9	7.52	1047	< 1	7.0	purge
1409	40	11.9	7.52	1042	< 1	7.0	water
1420	50	12.0	7.52	1042	< 1	7.0	No
1431	60	11.9	7.52	1042	< 1	7.0	reads
1441	70	11.9	7.51	1042	< 1	7.0	on
1445	72.5	-	-	-	-	-	meter

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 4-40ml VOA + 8-1liter Amber + 4-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu .1/Well HNu 0.5/O₂ 21.1%/LEL 0%/1325

hook up flow cell, sampling rate 300ml/15sec.

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT102A

DATE: 9/20/95

TIME: 1400

WEATHER: Overcast 65°

WELL CONDITION: Existing (see W.L. sheets)

WELL DEPTH (TOC): 18.16 ft. WATER LEVEL (TOC): 12.65 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 16 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 4.3 gallons

PURGE RATE: 0.28 gpm

SAMPLERS INITIALS: SGP, CAS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1430	0	16.1	7.38	825	23.8	2.9	
1435	1	15.8	7.38	717	6.5	2.6	
1439	2	15.6	7.36	727	1.75	2.5	
1442	3	15.6	7.35	724	1.25	2.5	
1445	4	15.6	7.33	721	1.1	2.5	
1448	5	15.6	7.32	724	1.0	2.5	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 1.0/Well HNu 0.8/O₂ 20.8%/LEL 0%/Purge 2-3 gals. because of high turbidity then hooked up flow cell

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETR	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT102B DATE: 9/20/95 TIME: 1123

WEATHER: Partly cloudy, upper 50°

WELL CONDITION: Existing (see W.L. sheets)

WELL DEPTH (TOC): 67.64 ft. WATER LEVEL (TOC): 12.31 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 65 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 55.13 gallons

PURGE RATE: 1.0 gpm SAMPLERS INITIALS: MTB, SMS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1209	0	12.4	7.94	410	-	> 250	
1216	5	11.9	7.73	403	2.1	0	
1221	10	11.8	7.65	399	1.0	0	
1226	15	11.8	7.61	398	1.1	0	
1231	20	11.7	7.53	407	.5	0	
1236	25	11.7	7.55	407	.5	0	
1241	30	11.7	7.57	407	.8	0	
1246	35	11.7	7.57	407	.5	0	
1251	40	11.7	7.57	407	1.0	0	
1256	45	11.7	7.58	407	.4	0	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.0/Well HNu 0.0/O₂ 21.0%/LEL 0%

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

WATER SAMPLING CONTINUATION SHEET

PROJECT: Himco Dump Superfund Site

WELL #: WT102B

DATE: 9/20/95

[illegible]

REMARKS: Start sampling @ 1319, completed @1336

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT111A

DATE: 9/22/95

TIME: 0945

WEATHER: Ptly sunny, 5-10mph sw wind 60°

WELL CONDITION: Existing (see W.L. sheets)

WELL DEPTH (TOC): 21.84 ft. WATER LEVEL (TOC): 14.35 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 18.7 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 6.2 gallons

PURGE RATE: 0.39 gpm

SAMPLERS INITIALS: SGP, MTB

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1112	-	-	-	-	> 200	-	Purged
1117	5	-	-	-	66.4	-	5 gal
1125	6	14.8	5.49	46	28	> 250	and
1128	7	14.8	5.6	46.5	18	> 250	hookd
1131	8	14.7	5.63	47.4	14	> 250	up
1134	9	14.7	5.61	47.7	10	> 250	flow
1137	10	14.5	5.67	47.7	7.1	> 250	cell
1140	11	14.4	5.61	47.7	6.0	> 250	
1143	12	14.4	5.51	47.8	4.3	> 250	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 1.2/Well HNu 0.9/O₂ 21.1%/LEL 0%/1150 begin sampling/1210 complete sampling

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETR	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT112A DATE: 9/19/95 TIME: 0800

WEATHER: Ptly sunny, 70°

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 17.94 ft. WATER LEVEL (TOC): 11.80 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 15 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 4.8 gallons

PURGE RATE: 0.25 gpm SAMPLERS INITIALS: SGP, CAS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
0927	0	15.7	7.54	648	36.8	4.5	Turb.
0931	1	15.9	7.53	642	16.6	4.1	high
0935	2	16.0	7.51	633	8.5	4.1	at
0939	3	16.0	7.50	625	3.6	3.9	first
0943	4	16.0	7.49	627	1.6	3.8	Purged
0947	5	16.0	7.49	625	0.95	3.8	2 gal
							then
							flow
							cell

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 8-40ml VOA + 12-1liter Amber + 4-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.1/Well HNu 0.1/O₂ 21.0%/LEL 0%/0954

began sample collection/1040-completed collection

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT112B

DATE: 9/19/95

TIME: 1419

WEATHER: Cloudy, cool 70°s

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 62.44 ft. WATER LEVEL (TOC): 11.97 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 59.8 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 50.36 gallons

PURGE RATE: 1.0 gpm

SAMPLERS INITIALS: MTB, SMS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1514	0	12.0	7.51	387	-	> 250	
1519	5	11.7	7.51	391	4.5	0	
1524	10	11.6	7.50	384	3.4	0	
1529	15	11.6	7.47	379	2.5	0	
1534	20	11.5	7.45	375	2.2	0	
1539	25	11.5	7.43	373	1.6	0	
1544	30	11.5	7.41	371	1.3	0	
1549	35	11.5	7.39	373	1.3	0	
1554	40	11.5	7.36	372	1.0	0	
1559	45	11.5	7.35	373	1.0	0	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.6/Well HNu 0.6/O₂ 20.9%/LEL 0%

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

WATER SAMPLING CONTINUATION SHEET

PROJECT: Himco Dump Superfund Site

WELL #: WT112B

DATE: 9/19/95

[illegible]

REMARKS:

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT113A

DATE: 9/18/95

TIME: 0830

WEATHER: Sunny 50°

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 24.69 ft. WATER LEVEL (TOC): 18.76 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 22 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 5.0 gallons

PURGE RATE: 0.12 gpm

SAMPLERS INITIALS: SGP, CAS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1150	< 1	16.9	7.34	202	33.1	8.5	*
1155	2	16.3	7.57	218	20.5	9.0	Pump
1201	3	16.0	7.59	218	5.8	9.0	rate
1206	4	15.9	7.61	188	4.6	9.0	surgd
1212	5	16.3	7.62	223	3.8	8.8	up
1222	6	18.1	7.60	223	3.4	8.9	
1225	7	15.2	7.60	216	5.5*	8.8	
1228	8	15.5	7.63	216	2.1	8.8	
1231	9	15.3	7.62	216	1.3	8.8	
1234	10	15.3	7.61	216	.8	8.9	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.4/Well HNu 0.5/O₂ 21.1%/LEL 0%/1300 completed sample collection

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETR	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT113B DATE: 9/18/95 TIME: 1515

WEATHER: Partly cloudy, upper 60 to 70°

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 70.14 ft. WATER LEVEL (TOC): 18.96 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 67.5 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 56 gallons

PURGE RATE: 0.93 gpm SAMPLERS INITIALS: SGP, SMS

TIME	GAL. S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1520	0	12.8	7.22	440	-	0.5	
1528	5	12.1	7.33	444	4.2	0	
1534	10	12.0	7.34	444	2.4	0	
1539	15	11.8	7.32	439	2.3	0	
1543	20	11.7	7.29	428	1.6	0	
1548	25	11.7	7.26	422	1.8	0	
1553	30	11.8	7.24	408	1.2	0	
1558	35	11.8	7.22	408	1.1	0	
1603	40	11.8	7.20	411	.8	0	
1608	45	11.8	7.20	408	.8	0	

DID WELL PUMP DRY? DESCRIBE: No. Pumped small amount of sand

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 1.0/Well HNu 1.0/O₂ 20.9%/LEL 0%

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

WATER SAMPLING CONTINUATION SHEET

PROJECT: Himco Dump Superfund Site

WELL #: WT113B

DATE: 9/18/95

[illegible]

REMARKS: Temp/pH/cond/diss O₂ measured with QED Purge Saver flow

cell. S/N 5224-0260-2012

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT114A

DATE: 9/21/95

TIME: 1258

WEATHER: Light rain, cool 50°

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 24.74 ft. WATER LEVEL (TOC): 18.10 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 22.1 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 6.58 gallons

PURGE RATE: 0.25 gpm

SAMPLERS INITIALS: SMS, MTB

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1328	0	15.3	7.08	1.96	-	> 250	
1333	1	15.6	7.08	1.96	19.1	> 250	
1340	2	15.5	7.05	1.96	16.8	> 250	
1345	3	15.4	7.04	1.96	17.6	42.2	
1351	4	15.4	7.03	1.95	10.9	30.3	
1356	5	15.4	7.02	1.95	3.5	48.5	
1400	6	15.4	7.01	1.95	2.1	18.2	
1404	6.6	15.5	7.01	1.96	-	> 250	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.4/Well HNu 0.2/O₂ 20.8%/LEL 0%/

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETR	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT114B

DATE: 9/21/95

TIME: 0905

WEATHER: Overcast, occasional drizzle 50°s

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 67.84 ft. WATER LEVEL (TOC): 18.15 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 65.2 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 49.75 gallons

PURGE RATE: 1.0 gpm

SAMPLERS INITIALS: MTB, SMS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
0938	0	12.8	7.17	844	-	> 250	
0943	5	12.8	7.17	849	8.6	0	
0948	10	12.7	7.12	870	3.7	0	
0953	15	12.7	7.09	874	2.9	0	
0958	20	12.7	7.04	874	1.8	0	
1003	25	12.8	7.14	853	1.2	0	
1008	30	12.7	7.06	874	.8	0	
1013	35	12.8	7.06	853	1.0	0	
1018	40	12.8	7.17	853	.7	0	
1023	45	12.8	7.10	857	.8	0	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.2/Well HNu 0.2/O₂ 20.8%/LEL 0%

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETR	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

WATER SAMPLING CONTINUATION SHEET

PROJECT: Himco Dump Superfund Site

WELL #: WT114B

DATE: 9/21/95

[illegible]

REMARKS: Sampling started at @ 1035, completed at @ 1051

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT115A

DATE: 9/25/95

TIME: 1410

WEATHER: Clear, breezy, lower 60's

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 19.89 ft. WATER LEVEL (TOC): 14.49 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 17.75 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 5.4 gallons

PURGE RATE: 0.25 gpm

SAMPLERS INITIALS: SMS, MTB

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1431	0	-	-	-	20.1	-	
1436	1	17.0	7.06	1166	8.3	3.7	
1441	2	16.6	7.00	1168	6.3	2.4	
1445	3	16.5	7.00	1162	4.6	1.6	
1449	4	16.4	6.99	1162	2.8	1.2	
1453	5	16.4	6.99	1162	2.3	0.8	
1455	5.5	16.4	6.98	1162	1.4	0.6	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.4/Well HNu 0.2/O₂ 21.0%/LEL 0%/Start sampling at @1501 and completed at 1514

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT116A DATE: 9/21/95 TIME: 0900

WEATHER: Overcast, 60° slight drizzle

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 15.14 ft. WATER LEVEL (TOC): 11.25 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 13 ft.

PURGE METHOD: Grunfos Pump

MINIMUM PURGE VOLUME*: 3.2 gallons

PURGE RATE: 0.31 SAMPLERS INITIALS: SGP, CAS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
0942	0	-	-	-	28	-	Black
0953	5	-	-	-	70	-	to
1000	8	-	-	-	38	-	dark
1002	8	17.5	6.91	3.15	-	0	gray
1006	9	18.0	6.89	3.46	29	0	color
1009	10	18.1	6.87	3.46	13	0	Purged
1012	11	18.1	6.87	3.47	9.5	0	8 gal
1015	12	18.1	6.84	3.47	7	0	hookd
1018	13	18.1	6.83	3.46	6.3	0	up
							cell

DID WELL PUMP DRY? DESCRIBE: No

SAMPLE TYPES: 4-40ml VOA + 8-1liter poly + PRP

splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 4.5/Well HNu 5.0/0₂ 21.0%/LEL 0%/ Slight

H₂S odor/Completed sampling at 1100

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT116B

DATE: 9/21/95

TIME: 1200

WEATHER: Overcast, 55° slight drizzle

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 60.63 ft. WATER LEVEL (TOC): 11.75 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 58 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 40 gallons

PURGE RATE: 0.61 gpm

SAMPLERS INITIALS: SGP, CAS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1345	0	12.0	6.97	821	18	0.3	
1354	5	12.2	6.94	821	4.5	0	
1402	10	12.2	6.91	821	0.8	0	
1412	15	12.2	6.92	821	0.8	0	
1418	20	12.2	6.93	826	< 1	0	
1426	25	12.2	6.93	821	< 1	0	
1434	30	12.2	6.93	821	< 1	0	
1442	35	12.2	6.93	821	< 1	0	
1450	40	12.2	6.93	821	< 1	0	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 6.0/Well HNu 6.0/O₂ 21.0%/LEL 0%/Purged 1 gallon and hooked up flow cell

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETR	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT117A

DATE: 9/26/95

TIME: 0923

WEATHER: Partly cloudy 50°

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 18.28 ft. WATER LEVEL (TOC): 14.64 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 16.64 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 3.7 gallons

PURGE RATE: 0.25 gpm

SAMPLERS INITIALS: SMS, MTB

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
0934	-	-	-	-	-	-	
0953	0	16.1	7.58	280	15.5	1.8	
0957	1	16.9	7.58	277	8.23	1.5	
1001	2	17.6	7.56	284	6.8	1.3	
1005	3	17.7	7.55	291	5.3	1.2	
1009	4	17.7	7.55	293	4.6	1.0	
1013	5	17.8	7.52	289	3.6	0.9	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.5/Well HNu 0.7/O₂ 20.8%/LEL 0%/Start sampling at @1020/completed at @1037

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETR	2"	4"	5"	6"	8"
MULTIPLR	0.16	0.65	1.02	1.47	2.61

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT117B

DATE: 9/26/95

TIME: 1239

WEATHER: Clear, sunny, upper 60's

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 63.47 ft. WATER LEVEL (TOC): 14.05 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 60.83 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 49.58 gallons

PURGE RATE: 1.0 gpm

SAMPLERS INITIALS: MTB, SMS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1306	0	14.1	7.59	623	12.6	0	
1311	5	13.7	7.62	651	2.0	0	
1316	10	13.5	7.61	658	1.0	0	
1321	15	13.4	7.59	654	.6	0	
1326	20	13.3	7.57	654	.5	0	
1331	25	13.3	7.54	650	.4	0	
1336	30	13.3	7.52	654	.3	0	
1341	35	13.3	7.49	655	.3	0	
1346	40	13.2	7.47	651	.3	0	
1351	45	13.2	7.46	651	.2	0	

DID WELL PUMP DRY? DESCRIBE: No.

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 1.0/Well HNu 1.0/O₂ 20.8%/LEL 0%

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

WATER SAMPLING CONTINUATION SHEET

PROJECT: Himco Dump Superfund Site

WELL #: WT117B

DATE: 9/26/95

[illegible]

REMARKS: Sampling started at @ 1400, completed at @ 1415

FIELD RECORD OF WATER SAMPLING

PROJECT: Himco Dump Superfund Site

WELL #: WT118B DATE: 9/25/95 TIME: 1020

WEATHER: Cloudy, cool 50°s

WELL CONDITION: New (see W.L. sheets)

WELL DEPTH (TOC): 65.14 ft. WATER LEVEL (TOC): 14.36 ft.

WELL DIAMETER: 2 in. PUMP DEPTH: 62.5 ft.

PURGE METHOD: Grundfos Pump

MINIMUM PURGE VOLUME*: 50.82 gallons

PURGE RATE: 1.0 gpm SAMPLERS INITIALS: MTB, SMS

TIME	GAL.S REM.	TEMP. (C)	pH	COND.	TURB. (NTU)	DIS. OXYGEN	REMARKS
1055	0	13.0	6.78	1.76	60.2	0	
1102	5	12.8	6.75	1.75	10.4	0	
1107	10	12.7	6.73	1.79	8.8	0	
1112	15	12.6	6.70	1.78	4.0	0	
1117	20	12.6	6.68	1.78	3.8	0	
1122	25	12.5	6.66	1.78	2.2	0	
1127	30	12.6	6.65	1.79	3.8	0	
1132	35	12.6	6.65	1.78	2.8	0	
1137	40	12.6	6.64	1.78	2.7	0	
1142	45	12.6	6.63	1.79	1.5	0	

DID WELL PUMP DRY? DESCRIBE: No. Purged about a total of 60
gallons

SAMPLE TYPES: 2-40ml VOA + 4-1liter Amber + 2-1liter poly + PRP
splits

SAMPLE NUMBERS: See Traffic Report

REMARKS: Background HNu 0.3/Well HNu 0.3/O₂ 20.8%/LEL 0%

* Purge volume = Depth of well (ft.) x Multiplier x 5

DIAMETER	2"	4"	5"	6"	8"
MULTIPLIER	0.16	0.65	1.02	1.47	2.61

WATER SAMPLING CONTINUATION SHEET

PROJECT: Himco Dump Superfund Site

WELL #: WT118B

DATE: 9/25/95

[illegible]

REMARKS: Sampling started at @ 1201, completed at @ 1216

APPENDIX H:
LABORATORY DATA

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

Chemical Oxygen Demand (COD)

LIMS#: 3509
Project: HIMCO Dump - Predesign

Date Sample Taken: 27 Sep 95 Customer Sample: H1MC-WH20-0001
Date Sample Received: 28 Sep 95 Lab Sample No: 950928-H063
Sample Description: Water Container: 1-250 mL poly

Extraction/Analysis Method: EPA Method 410.1
Date Analyzed: 10 Oct 95
Analyst: D. Sanders

RESULTS (mg/L)

Analysis for	Result	Detection Limits
Chemical Oxygen Demand	19	5
Biological Oxygen Demand	4	2

u: Below Detection Limit

Laboratory Comments:

Approved by:

Prem. N. Arora

Date:

10.11.95

DEPARTMENT OF THE ARMY, Corps of Engineers
Missouri River Division Laboratory, Omaha, Nebraska

Volatile Organics Analysis

FAMIS No: 3509

Project: HIMCO Dump - Predesign

Date Sample Taken: 27 Sep 95 Customer Sample No: H1MC-WH20-0004
Date Sample Received: 28 Sep 95 MRD Lab Sample No: 950929-H020
Date Analyzed: 06 Oct 95 Sample Container(s): 2-40 mL vials
Analyst: Leuschen Sample Matrix: Water
GC/MS File ID: water5801061 EPA Method: SW-846, Method 8240
Instrument ID: GCMSA Dilution Factor: 1.00
Batch ID: 951003w1 pH: 2

Analyte	Result	Units	Detection Limits
1. Chloromethane	u	µg/L	10
2. Bromomethane	u	µg/L	10
3. Vinyl Chloride	u	µg/L	10
4. Chloroethane	u	µg/L	10
5. Dichloromethane	u	µg/L	2.0
6. Acetone	u	µg/L	50
7. Carbon Disulfide	u	µg/L	2.0
8. 1,1-Dichloroethene	u	µg/L	2.0
9. 1,1-Dichloroethane	u	µg/L	2.0
10. 1,2-Dichloroethene (total)	u	µg/L	2.0
11. Chloroform	u	µg/L	2.0
12. 2-Butanone	u	µg/L	50
13. 1,2-Dichloroethane	u	µg/L	2.0
14. 1,1,1-Trichloroethane	u	µg/L	2.0
15. Carbon Tetrachloride	u	µg/L	2.0
16. Vinyl Acetate	u	µg/L	25
17. Dichlorobromomethane	u	µg/L	2.0
18. 1,2-Dichloropropane	u	µg/L	2.0
19. cis-1,3-Dichloropropene	u	µg/L	2.0
20. Trichloroethene	u	µg/L	2.0
21. Dibromochloromethane	u	µg/L	2.0
22. Benzene	u	µg/L	2.0
23. 1,1,2-Trichloroethane	u	µg/L	2.0
24. trans-1,3-Dichloropropene	u	µg/L	2.0
25. Bromoform	u	µg/L	2.0
26. 4-Methyl-2-Pentanone	u	µg/L	25
27. 2-Hexanone	u	µg/L	25
28. 1,1,2,2-Tetrachloroethane	u	µg/L	2.0
29. Tetrachloroethene	u	µg/L	2.0
30. Toluene	u	µg/L	2.0
31. Chlorobenzene	u	µg/L	2.0
32. Ethylbenzene	u	µg/L	2.0
33. Styrene	u	µg/L	2.0
34. meta-Xylene	u	µg/L	2.0
35. ortho-/para-Xylene	u	µg/L	2.0
Surrogate Standard	Recovery (%)	Acceptable	Spike (µg/L)
36. 1,2-Dichloroethane-d4	90	76-114	50
37. Toluene-d8	103	88-110	50
38. p-Bromofluorobenzene	101	86-115	50

u: Below Detection Limit

Approved By: David E. Splitchal Date: 10 Oct. 95

DEPARTMENT OF THE ARMY, Corps of Engineers
Missouri River Division Laboratory, Omaha, Nebraska

Volatile Organics Analysis

FAMIS No: 3509

Project: HIMCO Dump - Predesign

Date Sample Taken: 27 Sep 95 Customer Sample No: HIMC-WH20-0003
Date Sample Received: 28 Sep 95 MRD Lab Sample No: 950929-H021
Date Analyzed: 06 Oct 95 Sample Container(s): 2-40 mL vials
Analyst: Leuschen Sample Matrix: Water
GC/MS File ID: water5901062 EPA Method: SW-846, Method 8240
Instrument ID: GCMSA Dilution Factor: 1.00
Batch ID: 951003w1 pH: 2

Analyte	Result	Units	Detection Limits
1. Chloromethane	u	µg/L	10
2. Bromomethane	u	µg/L	10
3. Vinyl Chloride	u	µg/L	10
4. Chloroethane	u	µg/L	10
5. Dichloromethane	u	µg/L	2.0
6. Acetone	u	µg/L	50
7. Carbon Disulfide	u	µg/L	2.0
8. 1,1-Dichloroethene	u	µg/L	2.0
9. 1,1-Dichloroethane	u	µg/L	2.0
10. 1,2-Dichloroethene (total)	u	µg/L	2.0
11. Chloroform	u	µg/L	2.0
12. 2-Butanone	u	µg/L	50
13. 1,2-Dichloroethane	u	µg/L	2.0
14. 1,1,1-Trichloroethane	u	µg/L	2.0
15. Carbon Tetrachloride	u	µg/L	2.0
16. Vinyl Acetate	u	µg/L	2.5
17. Dichlorobromomethane	u	µg/L	2.0
18. 1,2-Dichloropropane	u	µg/L	2.0
19. cis-1,3-Dichloropropene	u	µg/L	2.0
20. Trichloroethene	u	µg/L	2.0
21. Dibromochloromethane	u	µg/L	2.0
22. Benzene	u	µg/L	2.0
23. 1,1,2-Trichloroethane	u	µg/L	2.0
24. trans-1,3-Dichloropropene	u	µg/L	2.0
25. Bromoform	u	µg/L	2.0
26. 4-Methyl-2-Pentanone	u	µg/L	2.5
27. 2-Hexanone	u	µg/L	2.5
28. 1,1,2,2-Tetrachloroethane	u	µg/L	2.0
29. Tetrachloroethene	u	µg/L	2.0
30. Toluene	u	µg/L	2.0
31. Chlorobenzene	u	µg/L	2.0
32. Ethylbenzene	u	µg/L	2.0
33. Styrene	u	µg/L	2.0
34. meta-Xylene	u	µg/L	2.0
35. ortho-/para-Xylene	u	µg/L	2.0
Surrogate Standard	Recovery (%)	Acceptable	Spike (µg/L)
36. 1,2-Dichloroethane-d4	91	76-114	50
37. Toluene-d8	102	88-110	50
38. p-Bromofluorobenzene	102	86-115	50

u: Below Detection Limit

Approved By: David E. Splinkel Date: 10 Oct. 95

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

Wet Chemistry

FAMIS No: 3509

Project: HIMCO Dump - Predesign

Date Sample Taken: 27 Sep 95 Customer Sample No: H1MC-WH20-0001
Date Sample Received: 28 Sep 95 MRD Lab Sample No: 950928-H062

Sample Description: Water

Sample Container: 1-125 mL poly

Analyst: ~~Deborah Dereshkevich~~ Vicky Rich

<u>Procedure</u>	<u>Analyses</u>	<u>Result mg/L</u>	<u>Detection Limits</u>	<u>Date Analyzed</u>
EPA-340.2	Fluoride	nrq	0.1	
EPA-310.2	Bicarbonate (as CaCO_3)	nrq	20	
EPA-310.2	Carbonate (as CaCO_3)	nrq	20	
EPA-160.1	Total Dissolved Solids	nrq	5	
EPA-160.2	Total Suspended Solids	4	4	03 Oct 95
EPA-180.1	Turbidity (FTU)	nrq	1	
EPA-150.1	pH	nrq		
EPA-120.1	Conductivity ($\mu\text{mhos/cm}$)	nrq	10	

nrq: Not Requested

na: Not analyzed

u: Below Detection Limit

Laboratory Comments:

Approved By:

Prem N. Arora

Date:

10/11/95